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November 8, 1977

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DEPARTMENT
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November 8, 1977 Volume 964 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Recording of "Territorial Assignments" in the Assignment Division of the Patent and Trademark Office

It has been the practice of the Assignment Division for many years to refuse to record "territorial assignments," that is, assignments purporting to transfer rights in a trademark registration (not a concurrent use registration) for less than the entire United States. Hereinafter, such documents will be recorded as long as the requirements of the Rules of Practice are met by the documents submitted.

The Office is not addressing the validity or effect of such documents by recording same, but is merely recognizing that such transfers may affect title to a registered mark and therefore ought to be recorded. At the time a Section 8 affidavit or declaration or an application for renewal is filed, the Examiner of Trademarks will consider the effect of such a document.

BERNARD A. MEANY,
Oct. 7, 1977. *Assistant Commissioner for Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 29,233, Re. S.N. 833,460, Filed Sept. 15, 1977, Cl. 313/102, IMAGE INTENSIFIER TUBE DEVICE, Augustinus Joannes Cuelenaere, et al., Owner of Record: *N.V. Optische Industrie "De Oude Delft," Delft, The Netherlands,* Attorney or Agent: Louis E. Marn, et al., Ex. Gp.: 252

3,263,928, Re. S.N. 832,524, Filed Sept. 12, 1977, Cl. 239/123, APPARATUS FOR EJECTING A MIXTURE OF LIQUIDS, Frederick E. Gusmer, Owner of Record: *Gusmer Corporation, Old Bridge, N.J.,* Attorney or Agent: Irvin S. Thompson, et al., Ex. Gp.: 313

3,670,142, Re. S.N. 832,847, Filed Sept. 13, 1977, Cl. 219/367, RECESS MOUNTED ELECTRIC AIR HEATER, John T. Attridge, Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.,* Attorney or Agent: C. L. McHale, et al., Ex. Gp.: 213

3,783,097, Re. S.N. 833,808, Filed Sept. 16, 1977, Cl. 162/358, HYDRODYNAMICALLY LOADED WEB PRESS WITH SLIPPER BEARING SHOES, Edgar J. Justus, Owner of Record: *Beloit Corporation, Beloit, Wis.,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 173

3,866,307, Re. S.N. 826,104, Filed Aug. 19, 1977, Cl. 228/180 R, METHOD FOR SOLDERING, FUSING OR BRAZING, Hans Hugo Ammann, et al., Owner of Record: Pfahl to *Western Electric Company, Inc., New York, N.Y.,* Ammann to *Bell Telephone Laboratories, Inc., Murray Hill, Berkeley Heights, N.J.,* Attorney or Agent: Reuben Spencer, Ex. Gp.: 323

3,900,645, Re. S.N. 834,136, Filed Sept. 19, 1977, Cl. 428/41, SCORED ADHESIVE LAMINATE, Burton D. Morgan, Owner of Record: *Morgan Adhesives Company, Stow, Ohio,* Attorney or Agent: Vern L. Oldham, et al., Ex. Gp.: 164

3,903,332, Re. S.N. 830,000, Filed Sept. 1, 1977, Cl. 427/207, ADHESION OF POLYESTER TO RUBBER USING AN ADHESIVE CONTAINING ADDED METAL COMPOUNDS, Robert J. Kelly, et al., Owner of Record: *Uniroyal, Inc., New York, N.Y.,* Attorney or Agent: Thomas A. Beck, Ex. Gp.: 162

3,903,665, Re. S.N. 830,512, Filed Sept. 6, 1977, Cl. 280/150 B, HEAT ENERGY TRANSMISSION CONTROL PANEL, David C. Harrison, Owner of Record: *Inventor,* Attorney or Agent: Stephen S. Townsend, et al., Ex. Gp.: 316

3,904,091, Re. S.N. 828,160, Filed Aug. 26, 1977, Cl. 224/2 B, SIDEARM HOLSTERS, H. Jack Jones, Owner of Record: *Wilma Catherine Jones, Orlando, Fla.,* Attorney or Agent: George H. Spencer, et al., Ex. Gp.: 314

3,905,219, Re. S.N. 833,604, Filed Sept. 15, 1977, Cl. 72/450, PINCER MECHANISM FOR PIPELINES, Edward Niederer, Jr., et al., Owner of Record: *Inventors,* Attorney or Agent: George M. Cole, et al., Ex. Gp.: 321

3,928,949, Re. S.N. 832,516, Filed Sept. 12, 1977, Cl. 51/401, HOLLOW BODY GRINDING MATERIALS, Eckhard Wagner, Owner of Record: *Norddeutsche Schleifmittel-Industrie Christiansen & Co., Hamburg, Germany,* Attorney or Agent: Leonard W. Sherman, et al., Ex. Gp.: 323

3,929,036, Re. S.N. 831,840, Filed Sept. 9, 1977, Cl. 74/711, LIMITED SLIP DIFFERENTIAL WITH NEGLIGIBLE BIAS UNDER LIGHT LOAD CONDITIONS, Noah A. Shealy, Owner of Record: *Clark Equipment Company, Buchanan, Mich.,* Attorney or Agent: Ernst H. Ruf, Ex. Gp.: 345

3,944,869, Re. S.N. 825,814, Filed Aug. 18, 1977, Cl. 313/519, DISPLAY PANEL WITH EXPANSIBLE, METALLIC CAPSULE CONTAINING MERCURY AND METHOD OF MAKING SAID CAPSULE, George J. Przybylek, Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 252

3,949,101, Re. S.N. 824,912, Filed Aug. 15, 1977, Cl. 426/557, HIGH PROTEIN PASTA FORMULATION, Paluri Ramachandra Murthy, Owner of Record: *Peavey Company, Minneapolis, Minn.,* Attorney or Agent: Orrin M. Haugen, Ex. Gp.: 172

3,962,213, Re. S.N. 834,506, Filed Sept. 19, 1977, Cl. 427/224, METHOD OF DRYING COATED WEBS, John H. Flynn, Owner of Record: *Inventor,* Attorney or Agent: Michael Ebert, Ex. Gp.: 162

3,990,679, Re. S.N. 833,605, Filed Sept. 15, 1977, Cl. 251/214, STEM SEALING FOR HIGH PRESSURE VALVE OR THE LIKE, Boyd D. Boitnott, Owner of Record: *Gray Tool Company, Inc., Houston, Tex.,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 341

3,997,294, Re. S.N. 832,450, Filed Sept. 12, 1977, Cl. 23/277 C, DEVICE FOR TREATING GASES, Gerhard Kritzler, Owner of Record: *Apparatebau Rothemuhle Brandt & Kritzler, Rothemuhle, Germany,* Attorney or Agent: Elliot A. Lackenbach, Ex. Gp.: 171

4,015,213, Re. S.N. 782,672, Filed Mar. 30, 1977, Cl. 250/211, CONTACTLESS LSI JUNCTION LEAKAGE TESTING METHOD, Roger L. Verkuil, Owner of Record: *International Business Machines Corporation, Armonk, N.Y.,* Attorney or Agent: None, Ex. Gp.: 256

4,026,314, Re. S.N. 831,303, Filed Sept. 7, 1977, Cl. 137/116.5, HIGH PRESSURE SAFETY VALVE, Jesse H. Turner, et al., Owner of Record: *Essex Group, Inc., Fort Wayne, Ind.,* Attorney or Agent: Lawrence E. Freiburger, et al., Ex. Gp.: 341

PATENT NOTICES

Certificates of Correction for the Week of Nov. 8, 1977

Re. 28,598	4,020,751	4,032,492	4,035,568
Re. 29,194	4,021,078	4,032,596	4,035,752
Re. 29,319	4,021,281	4,032,754	4,036,004
D. 220,684	4,021,285	4,032,851	4,036,149
D. 245,293	4,022,075	4,032,897	4,036,207
3,772,195	4,023,029	4,032,975	4,036,408
3,841,466	4,023,090	4,033,110	4,036,479
3,865,840	4,024,021	4,033,154	4,036,532
3,876,417	4,024,224	4,033,165	4,036,634
3,913,852	4,024,558	4,033,188	4,036,698
3,943,981	4,024,756	4,033,232	4,036,879
3,952,039	4,025,318	4,033,335	4,037,036
3,958,064	4,025,347	4,033,486	4,037,149
3,958,297	4,025,381	4,033,497	4,037,354
3,958,905	4,025,767	4,033,536	4,037,600
3,960,923	4,025,793	4,033,622	4,037,611
3,963,464	4,026,136	4,033,715	4,037,699
3,968,111	4,026,153	4,033,787	4,037,775
3,975,532	4,027,258	4,033,828	4,037,923
3,979,346	4,027,568	4,033,861	4,037,924
3,982,743	4,027,634	4,033,863	4,037,950
3,983,243	4,027,688	4,033,876	4,038,015
3,984,884	4,028,384	4,033,921	4,038,101
3,985,509	4,028,622	4,034,062	4,038,233
3,992,198	4,028,654	4,034,125	4,038,285
3,994,351	4,028,663	4,034,209	4,038,695
3,996,269	4,028,936	4,034,323	4,038,729
3,999,633	4,029,654	4,034,326	4,038,746
4,001,772	4,029,676	4,034,472	4,038,826
4,006,289	4,029,722	4,034,480	4,038,911
4,008,316	4,029,873	4,034,584	4,038,954
4,011,431	4,030,083	4,034,633	4,038,993
4,012,742	4,030,404	4,034,665	4,039,202
4,012,997	4,030,563	4,034,785	4,039,364
4,013,783	4,030,939	4,034,794	4,040,355
4,015,711	4,031,021	4,034,868	4,040,666
4,016,163	4,031,100	4,034,909	4,040,855
4,016,467	4,031,107	4,034,912	4,040,944
4,016,574	4,031,280	4,034,918	4,040,958
4,017,048	4,031,361	4,035,029	4,041,116
4,017,099	4,031,424	4,035,236	4,041,383
4,017,318	4,031,443	4,035,273	4,041,709
4,017,774	4,031,549	4,035,274	4,042,127
4,018,673	4,031,767	4,035,286	4,042,144
4,018,973	4,031,795	4,035,342	4,042,213
4,019,025	4,031,892	4,035,374	4,042,224
4,019,293	4,032,066	4,035,425	4,042,231
4,020,002	4,032,264	4,035,500	
4,020,095	4,032,330	4,035,539	
4,020,242	4,032,344	4,035,567	

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Virginia 22161 for $3.50 ($7.00 outside North American Continent). Requests for copies of patent applications must include the patent-application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 758,879. Fusible Heat Sink for a Cryogenic Refrigerator. Filed Jan. 12, 1977.

Patent 4,005,144. Ethynyl-Substituted Aromatic Ortho Diamines and Method of Synthesis. Filed Apr. 9, 1976. Patented Jan. 25, 1977. Not available NTIS.

Patent 4,005,327. Low Beam Velocity Retina for Schottky Infrared Vicicons. Filed Oct. 28, 1975. Patented Jan. 25, 1977. Not available NTIS.

Patent 4,005,366. System to Simulate Motion and Plasma Induced Signal Variations From Reentry Vehicles. Filed Aug. 18, 1975. Patented Jan. 25, 1977. Not available NTIS.

Patent 4,005,378. Surface Acoustic Wave Filter. Filed Nov. 25, 1975. Patented Jan. 25, 1977. Not available NTIS.

Patent 4,005,399. Impedance Sensitive Power Line Intrusion Alarm System. Filed Feb. 14, 1975. Patented Jan. 25, 1977. Not available NTIS.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,957,031. Light Collectors in Cylindrical Geometry. Filed May 29, 1975. Patented May 18, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent application 712,416. Polymer-Bound Metallocarborane Catalyst. Filed Aug. 6, 1976.

Patent application 736,902. Photometric Method and Apparatus for Measuring Packing Fraction of Terminated Fiber Optic Cables. Filed Oct. 29, 1976.

Patent application 737,807. On Line Electro-Optic Modulator. Filed Nov. 1, 1976.

Patent application 747,590. Low-Loss Single Filament Fiber Optic Connector. Filed Dec. 6, 1976.

Patent application 749,935. Densensitizer for N-Propyl Nitrate. Filed Dec. 13, 1976.

Patent application 753,646. Microstrip Hybrid Ring Coupler. Filed Dec. 20, 1976.

Patent application 756,575. Method and Means of Link Coupling With Separate Control of Link Reactance and Coupling Coefficient. Filed Jan. 3, 1977.

Patent application 757,429. Fourier Power Spectra of Optical Images Using CCD's. Filed Jan. 6, 1977.

Patent application 758,624. Complex Photodichroic Spatial Filter. Filed Jan. 12, 1977.

Patent application. 759,970. Non-Linear Analog-To-Digital Converter. Filed Jan. 17, 1977.

Patent application 761,749. A Method of Manufacturing Three Dimensional Integrated Circuits. Filed Jan. 23, 1977.

Patent 3,893,332. Leakage Test System. Filed Feb. 21, 1974. Patented July 8, 1975. Not available NTIS.

Patent 3,913,107. Noise Cancelling Magnetic Antenna for Use With Watercraft. Filed Sept. 6, 1974. Patented Oct. 14, 1975. Not available NTIS.

Patent 3,938,888. Automated Precision Flame-Emission Photometric Apparatus. Filed Feb. 3, 1975. Patented Feb. 17, 1976. Not available NTIS.

Patent 3,958,176. Method for Measuring Suitability of Aluminum for Use in Certain Propellants. Filed Feb. 24, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,961,169. Biased-Bit Generator. Filed Mar. 25, 1975. Patented June 1, 1976. Not available NTIS.

Patent 3,963,310. Liquid Crystal Waveguide. Filed Aug. 20, 1973. Patented June 15, 1976. Not available NTIS.

Patent 3,968,126. Ferrocene Derivatives and Their Preparation. Filed Mar. 22, 1974. Patented July 6, 1976. Not available NTIS.

Patent 3,976,596. Hydridometallic Carborane Catalytic Compounds. Filed Mar. 26, 1975. Patented Aug. 24, 1976. Not available NTIS.

Patent 3,983,832. Planning Ski Conversion to Stand-Off Armor. Filed July 18, 1975. Patented Oct. 5, 1976. Not available NTIS.

Patent 3,988,682. Voltage Ramp Temperature Controller. Filed June 23, 1975. Patented Oct. 26, 1976. Not available NTIS.

Patent 3,988,778. System for Random, Time Accurate Access to Recorded Material. Filed Feb. 10, 1975. Patented Oct. 26, 1976. Not available NTIS.

Patent 3,988,888. Filter/Cooler. Filed June 14, 1974. Patented Nov. 2, 1976. Not available NTIS.

Patent 3,992,683. Optically Pumped Collision Laser in Hg at 546.1 NM. Filed May 28, 1975. Patented Nov. 16, 1976. Not available NTIS.

Patent 3,994,696. Aluminum Soap Demisting Agent in Jet Fuel. Filed May 22, 1975. Patented Nov. 30, 1976. Not available NTIS.

Patent 3,995,155. Integrated Optical Data Bus Coupler. Filed June 6, 1975. Patented Nov. 30, 1976. Not available NTIS.

Patent 3,995,311. Optical Logic Elements. Filed Sept. 22, 1975. Patented Nov. 30, 1976. Not available NTIS.

Patent 3,995,957. Internally Referenced, Laser Intracavity Technique for Measuring Small Gains or Losses. Filed Oct. 16, 1975. Patented Dec. 7, 1976. Not available NTIS.

Patent 3,996,484. Interactive Negative Resistance Multiple-Stable State Device. Filed Sept. 5, 1975. Patented Dec. 7, 1976. Not available NTIS.

Patent 3,996,525. Acousto-Optically Tuned Laser. Filed May 12, 1975. Patented Dec. 7, 1976. Not available NTIS.

Patent 3,999,083. Automatic Threshold Circuit. Filed Mar. 31, 1975. Patented Dec. 21, 1976. Not available NTIS.

Patent 3,999,301. Reticle-Lens System. Filed July 24, 1975. Patented Dec. 28, 1976. Not available NTIS.

Patent 4,001,726. High Accuracy Sweep Oscillator System. Filed Jan. 23, 1976. Patented Jan. 4, 1977. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 658,487. Improved Nozzle for Use With Abrasive and/or Corrosive Materials. Filed Feb. 17, 1976.

Patent application 760,771. Improved Backwall Cell. Filed Jan. 19, 1977.

Patent application 767,912. Preparation of Dielectric Coatings of Variable Dielectric Constant by Plasma Polymerization. Filed Feb. 11, 1977.

Patent application 776,869. Solar Cell Collector and Method for Producing Same. Filed Feb. 22, 1977.

Patent 3,999,886. Hingeless Helicopter Rotor With Improved Stability. Patented Dec. 28, 1976. Not available NTIS.

Patent 4,000,929. Magnetic Bearing System. Patented Jan. 4, 1977. Not available NTIS.

Patent 4,005,574. Reverse Pitch Fan With Divided Splitter. Patented Feb. 1, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 776,037. Probe Station. Filed Mar. 9, 1977.

Patent application 776,387. Plastic/Mischmetal Incendiary Projectile. Filed Mar. 10, 1977.

Patent 4,010,921. Spacecraft Closed Loop Three-Axis Momentum Unloading System. Filed Aug. 20, 1975. Patented Mar. 8, 1977. Not available NTIS.

Patent 4,011,452. Antinarcissus Reflector Assembly for Infrared Detector. Filed Nov. 6, 1975. Patented Mar. 8, 1977. Not available NTIS.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,959,073. Reactor Hold-Down Arrangement. Filed June 6, 1973. Patented May 25, 1976. Not available NTIS.

Patent 3,970,936. Telecommunication Using Muon Beams. Filed May 29, 1973. Patented July 20, 1976. Not available NTIS.

Patent 3,970,956. Cylindrical Electron Beam Diode. Filed July 24, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,973,928. Apparatus for Diffusion Separation. Filed Jan. 28, 1949. Patented Aug. 10, 1976. Not available NTIS.

Patent 3,973,934. Apparatus for Diffusion Separation. Filed Feb. 23, 1949. Patented Aug. 10, 1976. Not available NTIS.

Patent 3,976,775. Method for Dissolving Plutonium Dioxide. Filed Jan. 23, 1975. Patented Aug. 24, 1976. Not available NTIS.

Patent 3,976,888. Fission Fragment Driven Neutron Source. Filed Jan. 23, 1975. Patented Aug. 24, 1976. Not available NTIS.

Patent 3,981,321. Vehicle Fuel System. Filed Sept. 24, 1974. Patented Sept. 21, 1976. Not available NTIS.

Patent 3,982,928. Separation of Uranium From (Th.,U)O Sub 2 Solid Solutions. Filed Jan. 3, 1975. Patented Sept. 28, 1976. Not available NTIS.

Patent 3,983,219. High Purity Polonium Recovery. Filed Oct. 1, 1973. Patented Sept. 28, 1976. Not available NTIS.

Patent 3,983,220. Recovery of Boric Acid From Ion Exchargers. Filed Nov. 7, 1974. Patented Sept. 28, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 700,244. Parachute Deployment and Container System. Filed June 28, 1976.

Patent application 743,441. Wide Band Proportional Transducer Array. Filed Nov. 19, 1976.

Patent application 743,723. 2,3,7,8-Tetraazaspiro (4.4) Nonane, 2,3,7,8-Tetraazaspiro-(4,4) Nona-2,7-Diene and Derivatives. Filed Nov. 22, 1976.

Patent application 747,453. Particulate Sampling Probe. Filed Dec. 3, 1976.

Patent application 761,831. Improved, Chirped Acousto-Optic Q Switch. Filed Jan. 24, 1977.

Patent application 770,332. Gradient Index Miniature Coupling Lens and Method of Fabrication. Filed Feb. 22, 1977.

Patent application 771,041. Doppler Processing Method and Apparatus. Filed Feb. 22, 1977.

Patent application 771,715. Knife Edge for Direct Measurement of the Electron Beam of a Scanning Electron Microscope. Filed Feb. 24, 1977.

Patent application 772,221. Strobe Light Having Reduced Electromagnetic Radiation. Filed Feb. 25, 1977.

Patent application 774,285. Hydro-Optic Vibration Detector. Filed Mar. 4, 1977.

Patent application 774,366. Liquid Propellant Guns. Filed Mar. 30, 1977.

Patent application 778,910. Fast Two Dimensional Fourier Transform Device. Filed Mar. 30, 1977.

Patent application. 781,243. Integrated Refractive Effects Prediction System. Filed Mar. 25, 1977.

Patent application 781,278. Desensitizing Agent for Compositions Containing Crystalline High-Energy Nitrates or Nitrates. Filed Mar. 25, 1977.

Patent 3,983,470. Superconducting Apparatus for Generating High Frequency Microwaves. Filed Aug. 20, 1975. Patented Sept. 28, 1976. Not available NTIS.

Patent 4,002,353. Towing Vehicle Having a Cart-Hitching Mechanism. Filed Aug. 27, 1975. Patented Jan. 11, 1977. Not available NTIS.

Patent 4,005,927. Broad Bandwidth Optical Modulator and Switch. Filed Mar. 10, 1975. Patented Feb. 1, 1977. Not available NTIS.

Patent 4,006,597. Method for Microwave Transmission Energy With Superconducting Apparatus. Filed June 3, 1976. Patented Feb. 8, 1977.

Patent 4,007,688. Timed Missile Flight Termination System. Filed Feb. 23, 1976. Patented Feb. 15, 1977. Not available NTIS.

Patent 4,007,700. Multiple Seafloor Storage and Supply System. Filed Oct. 28, 1975. Patented Feb. 15, 1977. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 692,284. Durable Antistatic Coating for Polymethylmethacrylate. Filed June 3, 1976.

Patent application 786,322. A System for Synchronizing Synthesizers of Communication Systems. Filed Apr. 11, 1977.

Patent application 788,045. Thermal Insulation Protection Means. Filed Apr. 15, 1977.

Patent application 788,704. Volumetric Direct Nuclear Pumped Laser. Filed Apr. 19, 1977.

Patent application 788,705. Nondestructive Method for Instrumenting Helicopter Rotor Blades. Filed Apr. 19, 1977.

Patent application 792,067. Composite Lamination Method. Filed Apr. 28, 1977.

Patent 3,635,573. Adjustable Chamfering Tool. Patented Jan. 18, 1972. Not available NTIS.

Patent 4,018,080. Device for Tensioning Test Specimens Within an Hermetically Sealed Chamber. Patented Apr. 19, 1977. Not available NTIS.

Patent 4,018,085. Amplifying Ribbon Extensometer. Patented Apr. 19, 1977. Not available NTIS.

Patent 4,018,533. Optical Instrument Employing Reticle Having Preselected Visual Response Pattern Formed Thereon. Patented Apr. 19, 1977. Not available NTIS.

Patent 4,019,179. Method of Locating Persons in Distress. Patented Apr. 19, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 776,039. Double Acting Dynamic Seal. Filed Mar. 9, 1977.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

Patent application 751,634. Bark Burning System. Filed Jan. 10, 1977.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents Washington, D.C. 20545

Patent application 659,439. Method and Apparatus for Detecting and Measuring Trace Impurities in Flowing Gases. Filed Feb. 19, 1976.

Patent application 664,858. Isotope Separation by Photodissociation of Van Der Waal's Molecules. Filed Mar. 8, 1976.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP-2, Washington, D.C. 20546

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U.S. DEPARTMENT OF THE ARMY
Office of Judge Advocate General, Patent Division, Room 2C-455, Pentagon, Washington, D.C. 20310

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U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

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U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

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U.S. ENVIRONMENTAL PROTECTION AGENCY
Room W513, 401 M St. SW.,
Washington, D.C. 20460

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch, Westwood Bldg., Bethesda, Md. 20014

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U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW.,
Washington, D.C. 20240

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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

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U.S. DEPARTMENT OF THE ARMY
Office of Judge Advocate General, Patent Division, Room 2C-455, Pentagon, Washington, D.C. 20310

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U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

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U.S. ENVIRONMENTAL PROTECTION AGENCY
Room W513, 401 M St. SW.,
Washington, D.C. 20460

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch, Westwood Bldg., Bethesda, Md. 20014

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U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW.,
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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

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U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

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U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

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Room W513, 401 M St. SW., Washington, D.C. 20460

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National Institutes of Health, Chief, Patent Branch, Westwood Bldg., Bethesda, Md. 20014

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U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

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Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

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Patent 3,998,124. Bomb Rack Arming Unit. Filed June 2, 1975. Patented Dec. 21, 1976. Not available NTIS.

Patent 3,998,408. Remote Elevated Platform. Filed Feb. 19, 1976. Patented Dec. 21, 1976. Not available NTIS.

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Patent 4,005,357. Electrostatic Field Sensor. Filed Feb. 13, 1976. Patented Jan. 25, 1977. Not available NTIS.

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TENNESSEE VALLEY AUTHORITY
Division of Law
Muscle Shoals, Ala. 35660

Patent 4,017,589. Production of Ammonium Polyphosphates From Melamine Phosphates. Filed Mar. 17, 1976. Patented Apr. 12, 1977. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 564,622. Improvement in Combustion Engine. Filed Apr. 2, 1975.

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Patent application 772,165. Simulator for Practicing the Mating of an Observer-Controlled Object With a Target. Filed Feb. 25, 1977.

Patent application 772,167. Device for the Detection of Phenol and Related Compounds. Filed Feb. 25, 1977.

Patent application 776,029. Apparatus and Method for Reducing Thermal Stress in a Turbine Rotor. Filed Mar. 4, 1977.

Patent application 776,146. Formulated Plastic Separators for Soluble Electrode Cells. Filed Mar. 10, 1977.

Patent 4,003,257. Analysis of Volatile Organic Compounds. Patented Jan. 18, 1977. Not available NTIS.

Patent 4,007,434. Notch Filter. Patented Feb. 8, 1977. Not available NTIS.

Patent 4,007,891. Engine Air Intake System. Patented Feb. 15, 1977. Not available NTIS.

Patent 4,008,348. Particulate and Solar Radiation Stable Coating for Spacecraft. Patented Feb. 15, 1977. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 8, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-22-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-3-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-1-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-22-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-27-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-18-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-15-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-7-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-12-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	7-9-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-1-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	3-17-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-1-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	2-3-77

Expiration of patents: The patents within the range of numbers indicated below expire during October 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,954,560 to 2,958,080, inclusive
Plant Patents..... Numbers 1,974 to 1,977, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,467

BENZYLCYANO-AMIDES

Manasse Nussim, Netanya; Ezra Levy, Peta-Tikva, and Jacob Naiman, Netanya, all of Israel, assignors to Plantex, Ltd., Netanya, Israel

Original No. 3,910,984, dated Oct. 7, 1975, Ser. No. 309,758, Nov. 27, 1972. Application for reissue Sept. 13, 1976, Ser. No. 722,355

Claims priority, application Israel, Dec. 20, 1971, 38412

Int. Cl.[2] C07C *121/75*

U.S. Cl. 260—465 D **1 Claim**

1. α-cyano-3,4,5-trimethoxy-dihydrocinnamamide.

Re. 29,468

PROCESS FOR MAKING A C_1-C_7 ALIPHATIC HYDROCARBYL ESTER OF AN N-[2,6-DI(C_1-C_7 ALKYL)PHENYL] α-AMINOCARBOXYLIC ACID

Anthony B. Clayton, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Original No. 3,882,162, dated May 6, 1975, Ser. No. 405,610, Oct. 11, 1973. Application for reissue July 1, 1976, Ser. No. 701,723

Int. Cl.[2] C07C *101/447*

U.S. Cl. 560—43 **7 Claims**

1. A process for synthesizing a C_1-C_7 aliphatic hydrocarbyl ester of an N-[2,6-di(C_1-C_7 alkyl)phenyl] α-aminocarboxylic acid from the corresponding 2,6-di(C_1-C_7 alkyl)aniline and the corresponding [chlorocarboxylic] *chloroacetic* acid ester, which comprises effecting with a catalytic quantity of 2,6-*di*(C_1-C_7 alkyl)aniline hydrochloride reaction of said aniline and said ester.

Re. 29,469

HYDROXYLATED 15-DEOXY DERIVATIVES OF 9-HYDROXYL-13-TRANS-PROSTENOIC ACID

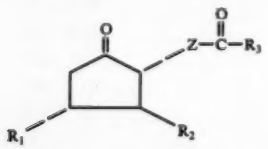
Middleton Brawner Floyd, Jr., Suffern, N.Y.; William James McGahren, Demarest, N.J.; Robert Eugene Schaub, Upper Saddle River, N.J., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Original No. 3,950,406, dated Apr. 13, 1976, Ser. No. 480,989, June 19, 1974. Continuation-in-part of Ser. No. 274,769, July 24, 1972, abandoned. Application for reissue May 3, 1976, Ser. No. 682,691

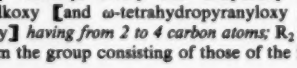
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—121 **39 Claims**

1. An optically active compound of the formula:

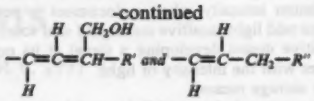


or a racemic compound of that formula and the mirror image thereof wherein R_1 is selected from the group consisting of hydroxy, [lower alkoxy, tetrahydropyranyloxy, lower alkanoyloxy,] *methoxy, ethoxy and* ω-hydroxy substituted [lower] alkoxy [and ω-tetrahydropyranyloxy substituted lower alkoxy] *having from 2 to 4 carbon atoms;* R_2 is a moiety selected from the group consisting of those of the formulae:



[—CH=CH—CH(CH₂OH)—R′ and —CH=CH—CH₂—R″]

-continued



wherein R′ is selected from the group consisting of [a straight chain alkyl group having from 2 to 10 carbon atoms and a straight chain alkyl group having from 2 to 6 carbon atoms and having one branched alkyl group of from 1 to 3 carbon atoms] *n-propyl, n-butyl and n-pentyl,* and R″ is a *a moiety* selected from the group consisting of [a straight chain alkyl group having from 2 to 10 carbon atoms and substituted with an hydroxy group, a stright chain alkyl group having from 2 to 6 carbon atoms and having one branched alkyl group of from 1 to 3 carbon atoms and substituted with an hydroxy group, a straight chain alkenyl group having from 2 to 10 carbon atoms and substituted with an hydroxy group and a straight chain alkenyl group having from 2 to 6 carbon atoms and having one branched alkyl group of from 1 to 3 carbon atoms and substituted with an hydroxy group;] *those of the formulae:*

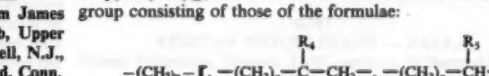
$$-Y-(CH_2)_m-CH_3,\ -CH_2-Y-(CH_2)_2-CH_3,$$

$$-(CH_2)_5-OH,\ -Y-\overset{trans}{CH=CH}-(CH_2)_p-CH_3\ and$$

$$-Y-CH_2-\overset{cis}{CH=CH}-(CH_2)_q-CH_3$$

wherein m is an integer from 3 to 5, inclusive, p is an integer from 1 to 3, inclusive, q is zero, 1 or 2, and y is

R_3 is selected from the group consisting of hydroxy[,] *and* alkoxy having from 1 to [12] *4* carbon atoms [and tetrahydropyranyloxy]; and Z is a divalent radical selected from the group consisting of those of the formulae:



—(CH₂)ₙ—O—CH₂— and —(CH₂)ₙ—S—CH₂—]

and —(CH₂)₄—O—CH₂—

wherein n is an integer from [3] *6* to 8, inclusive[, R_4 is an alkyl group having up to 3 carbon atoms, and R_5 is selected from the group consisting of an alkyl group having up to 3 carbon atoms, a fluorine atom and a phenyl group]; and the pharmacologically acceptable cationic salts thereof when R_3 is hydroxy.

Re. 29,470

CONTROL MECHANISMS FOR DOCUMENT-HANDLING APPARATUS

Alan P. Jones, Levittown, Pa., assignor to Brandt-Pra, Inc., Cornwells Heights, Pa.

Original No. 3,870,868, dated Mar. 11, 1975, Ser. No. 273,999, July 21, 1972. Application for reissue Mar. 29, 1976, Ser. No. 671,074

Int. Cl.[2] G06M *7/06*

U.S. Cl. 235—92 SB **17 Claims**

1. A sensor for detecting the presence of gaps between documents fed in a first direction at spaced intervals with said gaps occurring between the trailing edge of a document and the leading edge of the next document, said sensor comprising:

a light source positioned to one side of the path of movement of the documents;

light sensitive means positioned to receive light of maximum intensity from said light source when the trailing edge of each document passes said light sensitive means to activate said light sensitive means and to receive light of a minimum intensity when a document is positioned between said light sensitive means and said source, said light sensitive means developing a signal at its output which varies with the intensity of light;

energy storage means;

first means coupled to said light sensitive means output for rapidly charging said energy storage means when said light sensitive means is activated by light of maximum intensity;

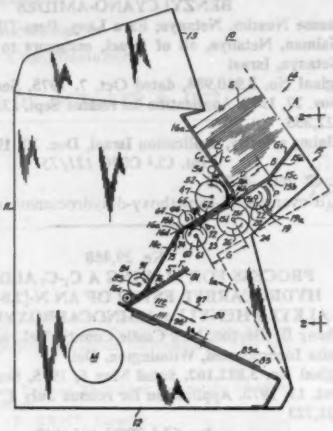
comparator means *normally maintained at a first output signal level and* having first and second inputs for generating [an] *a second* output signal *level different from said first output signal level* when the signal level at its first input exceeds the signal level at its second input;

said first input being coupled to the output of said light sensitive means;

second means coupled between said [first] *energy storage* means and said comparator means second input for coupling a portion of the signal level developed by said storage means to said second input;

said second means providing a discharge path for said energy storage means and being adapted to cause said energy storage means to discharge at a rate much slower than the charging rate to cause a substantial portion of the signal level developed by said storage means to be retained when said light sensitive means is deactivated due to the movement of the document past said light source;

storage means coupled to said comparator means and being charged to a first level when said comparator means develops said first output signal level and being discharged towards a second lower level when said comparator means develops an output which is at said second output signal level;



logical gating means responsive only to the simultaneous presence of said comparator means second output signal level and the discharge of said storage means to said second lower level to generate a count pulse representative of the passage of a document.

PLANT PATENTS

GRANTED NOVEMBER 8, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,143
CARNATION NAMED RENEGADE

David A. Krapes, Arvada, Colo., assignor to Denver Wholesale Florists Company, Denver, Colo.

Filed Oct. 7, 1976, Ser. No. 730,660
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—73 1 Claim

1. A new and distinct variety of carnation plant, substantially as herein shown and described, characterized by its high production of medium sized red flowers borne on long sturdy stems, and by the very sparse occurrence of splits and bullheading.

4,144
APPLE TREE

Robert B. Gordon, 8115 Ocean View Ave., Whittier, Calif. 90602

Filed Oct. 29, 1976, Ser. No. 736,955
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree substantially as shown and described, characterized as to novelty by the abundant production of medium to large size apples having a beautiful green and red coloring suitable for growing in the mild climatic coastal regions of Southern California, by the flesh of said apples which is crisp, firm, fine textured and very juicy and has a sweet-tart flavor and a distinct aroma making the apples excellent for both eating and cooking, by its long flowering period that commences early in April and continues throughout the month of May, by the deep deep pink color of the petals at the time the flowers first open, said deep pink color of the petals becoming progressively lighter pink as the flowers approach maturity and becoming a very pale pink at full maturity, by the early maturing of the fruit and by its long bearing season that provides ripe apples commencing in mid August and continuing until mid October, and by its vigorous, dense, upright growth habit that provides an attractive tree suitable for residential planting as well as for orchard use.

4,145
MAGNOLIA TREE

Carl H. Specht, North Salem, N.Y., assignor to Brooklyn Botanic Garden Corporation, Brooklyn, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,800
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of magnolia tree as herein described and illustrated, characterized by the tepals of the flower being a clear yellow with the outermost whorl slightly tinged with green.

4,146
ILEX VERTICILLATA BUSH NAMED WINTER RED

Robert C. Simpson, 1504 Wheatland Road, Vincennes, Ind. 47591

Filed Dec. 1, 1976, Ser. No. 746,477
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—65 1 Claim

1. A new and distinct variety of *Ilex verticillata* plant as herein shown and described, characterized by abundant fruit and the retention of the brilliant red fruit coloration, retaining this characteristic from October through March, its easy propagation from cuttings, and its vigorous growth habit.

4,147
AFRICAN VIOLET PLANT — PAULA

Werner Schwantje, Newark, Calif., assignor to Sunnyside Nurseries, Inc., Hayward, Calif.

Filed Jan. 3, 1977, Ser. No. 756,116
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct variety of African Violet as described and illustrated.

PLANT PATENTS

GRANTED NOVEMBER 8, 1977

PATENTS

GRANTED NOVEMBER 8, 1977

ERRATA

For CLASS	See PATENT NO.
407–114	4,056,871
407–114	4,056,872
075–00.5 R	4,056,874
043–003	4,056,890
214–777	4,057,161
366–123	4,057,222
366–172	4,057,223
366–336	4,057,224
366–157	4,057,225
366–244	4,057,226
366–002	4,057,227
366–079	4,057,228
200–016 D	4,057,520
542–428	4,057,545
544–182	4,057,546
544–184	4,057,547
424–305	4,057,556
548–305	4,057,558
560–121	4,057,571
560–053	4,057,572
560–052	4,057,573
560–053	4,057,574
560–245	4,057,575
423–127	4,057,611
235–413	4,057,708
235–145 R	4,057,710
364–600	4,057,711
364–426	4,057,712
364–476	4,057,713
364–494	4,057,714
364–494	4,057,715
364–802	4,057,717
362–249	4,057,718
365–076	4,057,786
365–104	4,057,787
365–174	4,057,788
365–189	4,057,789
560–121	4,057,851

PATENTS

GRANTED NOVEMBER 8, 1977

ERRATA

Cl.	Pat. No.
427-114	4,059,671
427-114	4,059,672
428-002 R	4,059,674
428-002	4,059,960
214-777	4,057,161
206-122	4,057,222
206-172	4,057,227
366-136	4,057,224
366-137	4,057,225
366-264	4,057,226
366-002	4,057,227
366-019	4,057,228
206-046 D	4,057,550
242-158	4,057,542
244-121	4,057,546
244-134	4,057,547
414-219	4,057,539
340-309	4,057,529
340-121	4,057,771
340-071	4,057,273
340-071	4,057,275
340-001	4,057,274
340-145	4,057,275
423-137	4,057,611
215-413	4,057,708
215-145 R	4,057,710
104-007	4,057,711
104-424	4,057,712
104-479	4,057,713
104-494	4,057,714
104-494	4,057,715
104-007	4,057,717
142-249	4,057,718
365-078	4,057,780
365-104	4,057,787
365-174	4,057,788
365-189	4,057,790
340-121	4,057,811

PATENTS

GRANTED NOVEMBER 8, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

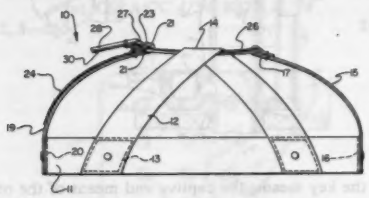
GENERAL AND MECHANICAL

4,056,852

ADJUSTABLE HELMET SUSPENSION SYSTEM

John H. Greendale, Holliston, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,334
Int. Cl.[2] A42B *3/00*
U.S. Cl. 2—417 **10 Claims**



1. In an adjustable helmet suspension system for adjusting the height at which a helmet is worn on the head comprising a headband sized to fit snugly within said helmet and to be attached to the inner surface of said helmet at a plurality of points, a front suspension strap attached at one end thereof to said headband at approximately the midpoint of the front of said headband and having a loop formed at the free end thereof, and a rear suspension strap attached at one end thereof to said headband at approximately the midpoint of the rear of said headband and having a loop formed at the free end thereof, the improvement which comprises, a continuous strand of cord having two ends, said continuous strand of cord being threaded through the loops of said front and rear suspension straps in such a way as to form a doubled strand of said cord to support said front and rear suspension straps in operating position resting against the head of the wearer, said doubled strand being adjustable in circumference by having each of said two ends of said continuous strand of cord forming said doubled strand attached to a tab which comprises the hook elements of a hook and pile fastener and by having the pile element of said hook and pile fastener attached to said rear suspension strap, said pile element and said hook elements cooperating for adjustably fastening said tab at various positions along said rear suspension strap and firmly holding said tab with said doubled strand of cord adjusted to greater or smaller circumferences, said suspension straps being thereby rendered adjustable so that the ends thereof through which said continuous strand is threaded are spaced farther apart or closer together on the head of the wearer by the adjustment of the circumference of said doubled strand of cord, whereby the height at which a helmet containing said adjustable helmet suspension system is supported on the head of the wearer is adjustable.

4,056,853

SYSTEM FOR LOCKING, IN AN EASILY DISENGAGEABLE MANNER, THE LENSES TO EYEGLASSES, SPORTIVE SWIMMING GOGGLES OR DIVING MASKS AND SIMILAR GENERAL SPORTIVE ARTICLES, AND THE RESULTING ARTICLES

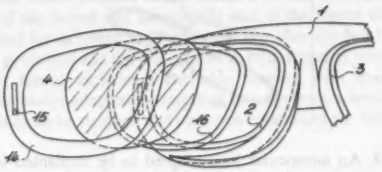
Franco Bottazzini, and Laura Donati, both of Genoa, Italy, assignors to K.D. Ottica s.n.c., Genoa, Italy

Filed May 25, 1976, Ser. No. 689,886
Claims priority, application Italy, May 26, 1975, 12621/75
Int. Cl.[2] A61F *9/02*; G02C *3/02*
U.S. Cl. 2—443 **3 Claims**

1. A readily disengageable locking assembly for the lenses of eyeglasses, swimming goggles, diving masks and the like, comprising:

a lightweight, relatively rigid, plastic body having two rearwardly-disposed, countersunk seats having planar bottoms, lying in the same plane, each of which is configured to accommodate a packing and a lens, and each of which has a forwardly-disposed, oppositely-arranged, outwardly-flaring, U-shaped rim with the ends of the rim directed toward the respective lateral ends of said body, said rims each having a groove formed therein along the inner periphery thereof, said body also having at each lateral end thereof a casing having an elongated slit extending therethrough, perpendicular to the planar bottoms of said seats;

a packing disengageably received within each of said countersunk seats;



a lens disengageably received within each of said packed countersunk seats;

a frame, disengageably and slidably received within said groove of each of said rims, for maintaining said lenses and packing in a correct position with respect to said seats, said frames each having a corresponding slit formed therein which, when fully inserted in said groove of said rims, is aligned with said slit of said casings; and

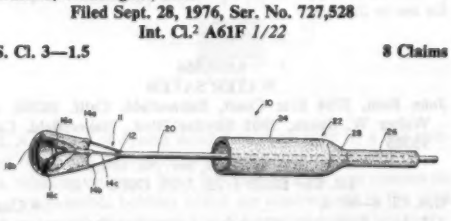
a disengageable locking member insertable within said slits of said frames and casing, to effect locking of said assembly.

4,056,854

AORTIC HEART VALVE CATHETER

John W. Boretos, Rockville, Md., and Robert A. Poirier, Rochester, Minn., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 28, 1976, Ser. No. 727,528
Int. Cl.[2] A61F *1/22*
U.S. Cl. 3—1.5 **8 Claims**



1. A prosthetic valve device for remote placement in a major blood vessel to take over the function of a malfunctioning natural valve comprising:

an expansible valve support;

means biasing said support toward an open configuration to sealingly engage the interior walls of the blood vessel in which it is to be placed;

check valve means in said support to block flow through said support in one direction;

means to constrict said support in a closed configuration such that said device may be navigated through a blood vessel to a desired point of placement;

means to remotely position said device through a blood vessel to a desired point of placement; and

means to remotely remove said means to constrict from said support at a desired point of placement.

4,056,855

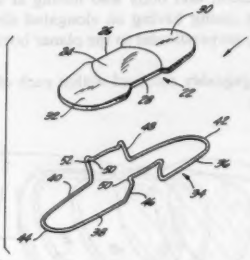
INTRAOCULAR LENS AND METHOD OF IMPLANTING SAME

Charles Kelman, 150 E. 58th St., New York, N.Y. 10022

Filed Apr. 7, 1976, Ser. No. 674,392

Int. Cl.[2] A61F *1/16, 1/24*

U.S. Cl. 3—13 4 Claims



3. An intraocular lens adapted to be implanted in the eye comprising; a lens member, a support wire having a predetermined configuration so as to have surfaces thereon for mounting the wire in the eye and surfaces thereon for receiving the lens member in coupled interengagement therewith after the wire is mounted in the eye, the supporting wire being resilient and including an elongated loop forming a base and having a pair of upstanding integral aligned legs extending intermediate the ends of the longer sides of the base, each leg terminating in an inwardly extending arcuate flange to form a recess therebetween, the lens being substantially elliptical in configuration and being slightly larger than the distance between the legs of the supporting wire when in relaxed position to that upon application of sufficient pressure to separate the resilient legs of the supporting wire away from one another the lens can be snapped into position in the recesses formed by the opposing flanges on the legs whereby a release of the legs and their tendency to return to the relaxed configuration will engage and hold the lens in position, the base being extendable into the posterior portion of the eye to be held in fixed position therein and in turn permitting the legs to extend into the anterior portion of the eye and hold the interengaged lens in position for use in the eye.

4,056,856

WATER SAVER

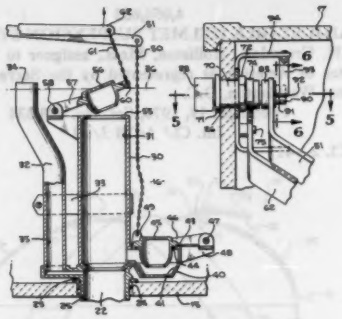
John Reid, 2704 Eric Court, Bakersfield, Calif. 93306, and Walter W. Stiern, 2901 Skyline Blvd., Bakersfield, Calif. 93305

Filed May 10, 1976, Ser. No. 684,485

Int. Cl.[2] E03D *1/22, 5/09;* G05G *1/10*

U.S. Cl. 4—67 A 8 Claims

1. In a flush tank which has a chamber for water, a float controlled inlet valve and a flush outlet, a flush mechanism comprising a standpipe at the outlet, having a low level discharge passageway, a high level passageway, and a valve element for each passageway, a full flush lever having a captive end means mounted on the flush tank with a free end attached to the low level valve element and a partial flush lever having a captive end means pivotally mounted on the flush tank with a free end attached to the high level valve element, an operating shaft having a pivotal mounting on said flush tank and a handle, a positive drive between said shaft and said full flush lever and a free sliding engagement with said partial flush lever during rotation of said shaft in one direction, said shaft having in the opposite, rotational direction a positive drive with the partial flush lever and a free sliding engagement with the full flush lever, a radially retractable key means on the shaft, the captive end means of one of said levers having a shoulder and an adjacent space with the shoulder facing one



side of the key means, the captive end means of the other of said levers having a shoulder and adjacent space with the shoulder facing the opposite side of the key means whereby rotation of the shaft in one direction operates one only of said levers and in the other direction only the other of said levers.

4,056,857

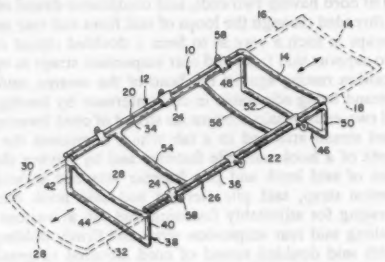
CONVERTIBLE BACKPACK AND COT CONSTRUCTION

Reginald L. Quantz, 413 Magellan Place, Richmond, Canada

Filed July 19, 1976, Ser. No. 706,235

Int. Cl.[2] A45F *4/06*

U.S. Cl. 5—112 6 Claims



1. A convertible backpack and cot construction comprising:

a first horizontal substantially U-shaped tubular frame having an extensible bight portion and a first pair of telescoping leg assemblies connected to said bight portion said leg assemblies including relatively movable inner and outer legs, said inner legs being movable relative to said outer legs and connected to said bight portion permitting the extension of said bight portion relative to said outer legs;

a second horizontal substantially U-shaped tubular frame having an extensible bight portion and a second pair of telescoping leg assemblies connected to said bight portion said leg assemblies including relatively movable inner and outer legs, said inner legs being movable relative to said outer legs and connected to said bight portion permitting the extension of said bight portion relative to said outer legs;

the outer legs of said first and second telescoping leg assemblies of said first and second tubular frames being in abutment;

means for retaining the outer legs of said first and second leg assemblies in abutment;

a first and second vertical substantially U-shaped frame

having their legs depending from opposite ends of the second pair of telescoping leg assemblies of said second horizontal U-shaped tubular frame with the bight portions of each vertical frame being adapted to support said horizontal frames on a surface; and

cover means for said horizontal and vertical frames.

4,056,858

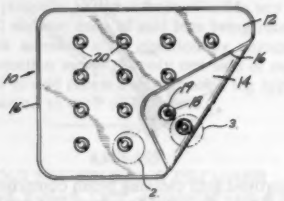
INFLATABLE CUSHION AND METHOD OF MAKING THE SAME

Carl W. Weber, 201 N. Main St., Van Buren, Ohio 45889

Filed Oct. 31, 1975, Ser. No. 627,521

Int. Cl.[2] A47C *4/54*; B32B *31/04*

U.S. Cl. 5—365 **2 Claims**



1. In an inflatable cushion comprising two sheets of flexible thermoplastic sheet material bonded marginally and at substantially uniformly spaced intervals and having a valved inflation opening, the improvement wherein each of the spaced bonds comprises a heated bonded area of less thickness than the combined thickness of said sheets and including a plurality of closely spaced integral ribs projecting from one face, said area being surrounded by an integral reinforcing portion of greater thickness than the bonded area and greater thickness than the combined thicknesses of said sheets, and including an integral marginal rib projecting between the portions of the sheets encircled by said endless bond.

4,056,859

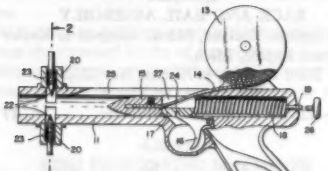
WIRE STRINGING DEVICE

Joseph L. Pace, Brooklyn, N.Y., assignor to Lawrence Peska Assoc., New York, N.Y.

Filed Feb. 6, 1976, Ser. No. 655,968

Int. Cl.[2] E21C *29/16*; F41B *7/00*; B21F *1/00*

U.S. Cl. 7—14.1 R **3 Claims**



1. An electricians wire stringing assistance device comprising:

a. A barrel carried upon a laterally outstanding gripping handle, said barrel having a cylindrical bore therein, which is closed at the rearward base end and open at the forward muzzle end and with a forward extending portion, extending forwardly of the handle, a longitudinal slot in the forward extending portion of the barrel opposite of the handle, terminating in an abutment adjacent to the muzzle end thereof;

b. means for dispensing flexible line, said means being mounted on the barrel adjacent to the base end of the slot and adapted for feeding the line into the slot;

c. a spring within the bore abutting against the base end of the barrel and being adapted to drive forwardly toward the muzzle end of the barrel when released from a compressed position in the rear portion thereof;

d. a slotted piston carried within the bore against the forward end of the spring including compression means for drawing the piston rearward in order to compress the spring, the slot of said piston being adjacent to the slot of said barrel and adapted for guiding the line as the wire is fed into the slot of the barrel;

e. a trigger mounted to the handle and adapted for engaging the piston and holding the spring in a compressed position and for releasing the piston in response to finger pressure, thereby permitting a dart, set within the barrel and affixed to the line, to be projected from the device carrying the line to its destination; and

f. a cutter means situated on the barrel between the muzzle end of the barrel and the muzzle end of the barrel slot, adapted for stripping and cutting the line after the dart has been projected and the line carried to its destination which cutter means includes a rotatable housing with spring loaded blades adapted for insertion into the bore, whereby the line can be stripped and cut upon rotation of the housing.

4,056,860

METHOD OF DYEING WOUND UP YARN

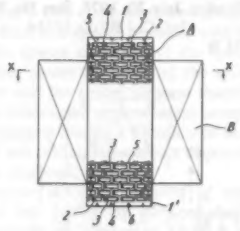
Nobutaka Ono, Ashiya, Japan, assignor to Osaka Bobbin Kabushiki Kaisha, Japan

Filed Jan. 22, 1976, Ser. No. 651,333

Claims priority, application Japan, Oct. 13, 1975, 50-123708

Int. Cl.[2] D06B *5/18*

U.S. Cl. 8—155.1 **3 Claims**



1. A method of dyeing wound-up yarns spun by a fine spinning frame and wound into cops, comprising the steps of:

a. winding up yarns from the cops directly into cheeses on compressible bobbins which are contractable in the axial and radial directions when compressed axially and carrying out the winding under a yarn tension substantially equal to the maximum of the fluctuating yarn tensions which occur during unwinding from the cops,

b. piling at least two bobbins having cheese wound thereon one atop another in end-to-end relationship on a spindle of a carrier to form a bobbin pile,

c. axially compressing the bobbins so as to effect axial and radial contraction of the bobbins to an extent sufficient to uniformly relax the yarns due to slackening of the yarns in the direction of winding traverse on the bobbins and due to contraction of the bobbins in the radial direction, and

d. dyeing the cheeses while the bobbins are maintained in the compressed state with the yarns uniformly relaxed.

4,056,861

BUOYANT LIFE-SAVING DEVICE

James L. Cornforth, 728 Wayne St., Jackson, Mich. 49201

Continuation of Ser. No. 631,510, Nov. 13, 1975, abandoned.
This application Dec. 3, 1976, Ser. No. 747,101
Int. Cl.[2] B63C 9/00
U.S. Cl. 9—14 6 Claims

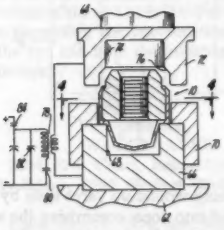
1. A life-saving device having, in combination, a sole buoyant member of sufficient weight to permit being thrown, and a flexible net-like web envelope surrounding and confining said buoyant member, said web being formed of a buoyant material and having openings of sufficient dimension to permit said web to be readily grasped through said openings, said web envelope being substantially larger than said buoyant member but small enough to effectively support a swimmer when the net is grasped whereby said web envelope is loosely disposed about said buoyant member when said member is floating permitting said web to float and spread away from said member on the surface of the water to facilitate grasping by a swimmer.

4,056,862

METHOD AND APPARATUS FOR FORMING A WHEEL NUT WITH WELDED CAP

Joseph W. Chaivre, and Albert A. Jadach, both of Royal Oak, Mich., assignors to Towne Robinson Fastener Company, Southfield, Mich.

Continuation-in-part of Ser. No. 672,746, April 1, 1976. This application July 30, 1976, Ser. No. 710,256
Int. Cl.[2] B21D 53/24
U.S. Cl. 10—72 R 10 Claims



1. The method of forming a wheel nut having polygonal wrench flats, a conical wheel engaging end, and a stainless steel sheath which covers the wrench flats and the end of the nut opposite to the conical end and terminates adjacent the joinder between the wrench flats and the conical end, comprising: bringing a first electrode into pressured contact with the conical nut end; bringing a second electrode into pressured contact with a section of the sheath directly overlying the nut to exert forces between the sheath and the nut in the area adjacent to that contacted by the second electrode; and passing an electric pulse having a duration of less than 30 microseconds and a peak current in excess of 50,000 amperes, between said first and second electrodes, to form a weld between the contacting surfaces of the sheath and the nut at said areas adjacent to the section contacted by the second electrode without deleterious metallurgical changes occurring in the surface of the sheath contacted by said second electrode.

4,056,863

GRILL CLEANING BRUSH

Armen G. Gunjian, 11270 Boulevard l'Acadie, Montreal, Quebec, Canada

Filed Aug. 2, 1976, Ser. No. 710,667
Int. Cl.[2] A46B 3/18
U.S. Cl. 15—160 2 Claims

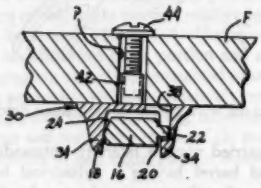
1. An improved grill cleaning brush comprising a handle, a pair of straight shanks extending from said handle in substantially parallel contiguous relation, and a cleaning element carried by each shank remote from said handle, each cleaning element being in the form of high tensile wire bristles radiating from the respective shank along an end portion thereof, said bristles being densely arranged and resisting intermeshing of said cleaning elements wherein said shanks would normally diverge from said handle, and a clip encircling said shanks adjacent said cleaning elements and spaced from said handle, said clip maintaning said shanks in said parallel relation between said handle and said clip, said clip further forcing said bristles of the two cleaning elements into meshing engagement with the resistance of said bristles to such meshing engaging effecting a diverging of said shanks beyond said clip and said cleaning elements automatically assuming a V relationship defining a V-shaped end portion on said brush for receiving a grill rib therebetween, said wire bristles being tightly engaged in overlapping relation adjacent said clip and constantly defining a positive cleaning bridge for preventing a grill rib to pass between said cleaning elements to said clip even when a high cleaning pressure is applied.

4,056,864

BACK AND BAIL ASSEMBLY

Edwin J. Driesenga, Zeeland, Mich., assignor to Keeler Corporation, Grand Rapids, Mich.

Filed Oct. 28, 1975, Ser. No. 625,830
Int. Cl.[2] A47B 95/02
U.S. Cl. 16—126 17 Claims



1. A furniture hardware assembly comprising a handle and a pair of back members for pivotally attaching said handle on furniture; each of said back members including attachment means for attaching said back member to furniture and a pair of spaced, generally opposing wall surfaces, at least one of said

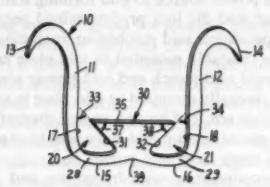
wall surfaces including a recess closed at one end; said handle including a pair of legs, each leg including projection means extending from only one side thereof for insertion in said recess of one of said back members; said recess being of sufficient size to receive only said projection means but not the remainder of either side of said leg; means on the opposite side of said leg from said projection means for rotating said leg into said back member without contact between said opposite side of said leg and the other of said wall surfaces opposite said wall surface including said recess, said means including a cut-away portion on the opposite side of each of said legs from said projection means providing the clearance room for rotating each of said legs and its respective back member with respect to one another without such contact whereby said leg is positioned between said wall surfaces after said projection means is inserted in said recess; said opposite side of said leg being in adjacent and abutting relationship to said other wall surface without being pivotally joined to or received in any portion of said other wall surface; each of said legs being retained in its respective back member after insertion by engagement between said projection means on only one side of said leg and said closed end of said recess although each leg appears to be pivotally connected to each wall surface.

4,056,865

POULTRY TRUSSING RETAINER

John Keen Cloyd, Turlock, Calif., assignor to Volk & Son Manufacturing Co., Inc., Turlock, Calif.

Filed Dec. 10, 1976, Ser. No. 749,217
Int. Cl.[2] A22C *21/00*
U.S. Cl. 17—1 S **11 Claims**



1. A dressed poultry trussing retainer comprising:

a pair of arms, joined at one end by an interconnecting flap, each arm having at its other end an outwardly-extending finger for grasping the bone structure of the poultry carcass,

said flap being resilient and rotatable relative to said arms so that the tail of the poultry may be tucked between said arms,

said arms and flap defining a pair of sockets that receive and secure the exposed hocks of the poultry,

whereby said fingers grasp the bone structure of the poultry carcass while said sockets receive and retain the hocks.

4,056,866

FISH PROCESSING MACHINES

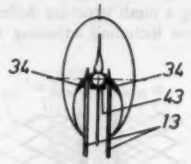
Werner Wenzel, Lubeck, Germany, assignor to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Apr. 8, 1976, Ser. No. 675,117
Int. Cl.[2] A22C *25/16*
U.S. Cl. 17—57 **5 Claims**

1. A filleting machine for filleting fish wherein said fish are transported belly-side-down and head end leading along a conveying path, said machine comprising

a pair of space-apart belly filleting knives for making respective incisions in the belly of a fish transported along said conveying path, to provide separated flank fillets at opposite sides of the belly cavity.

a pair of spaced-apart bone knives located downstream of said belly filleting knives along said path and positioned to extend upwardly through the belly cavity of the fish and to cut upwardly through the vertebral appendages on either side of the fish backbone whereby to separate said vertebral appendages from said backbone without cutting the flank fillets from the fish.



a pair of rib knives located downstream of said bone knives and arranged to extend into said belly cavity for cutting the severed vertebral appendages from said flank fillets while leaving the latter intact with said backbone,

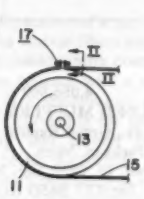
and a pair of back knives located downstream of said rib knives for cutting the flank fillets from said fish.

4,056,867

ELEVATOR BELT SPLICE

Edward Wert, and Chester Donald Fisher, both of Muncy, Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 24, 1976, Ser. No. 717,258
Int. Cl.[2] F16G *3/08*
U.S. Cl. 24—37 **4 Claims**



1. In a splicer for a belt comprising juxtaposed splicer elements between which is a spacer element, with belt ends disposed between the spacer element and the splicer elements, and with adjustable means for drawing the splicer elements toward each other and the spacer element thereby compressing the belt end portions, the improvement comprising:

a. the splicer elements having a plurality of belt contacting surfaces, said belt contacting surfaces disposed on the ends of the splicer elements,

b. a spacer element having a plurality of belt contacting surfaces, said belt contacting surfaces disposed on the opposing surfaces of the spacer element on the ends thereof,

c. first means projecting from said belt contacting surfaces of said splicer means, said first projecting means adapted to engage said belt ends; and

d. second means projecting from said belt contacting surfaces of said spacer means, said second projecting means adapted to engage said belt ends.

4,056,868

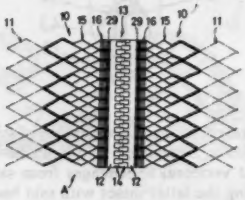
NET JOINTING STRUCTURE

Hiroyuki Ebata, Uozu, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Sept. 29, 1976, Ser. No. 727,797
Claims priority, application Japan, Oct. 4, 1975, 50-120061
Int. Cl.[2] A44B *19/00*
U.S. Cl. 24—205.16 C **3 Claims**

1. A net jointing structure for jointing together confronting ends of a primary net structure, which jointing structure comprises a pair of warp knitted net adapters; each adapter having

a net transition region disposed for connection to a respective end of the primary net structure, and a web region bearing a stringer of a sliding clasp fastener, the stringers associated with said adapters being selectively interengageable to releaseably join said adapters together along a junction line; said net transition region having a mesh structure defined by warp chains, said mesh structure including adjoining regions of different



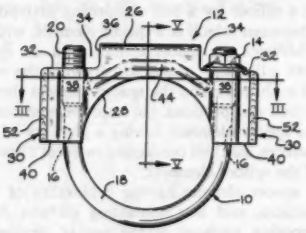
mesh size arranged with the smallest mesh size region adjoining said web region and the largest mesh size region being that for connection to said end of the primary net structure; warp chains of said net transition region extending into said web region transversely to said junction line and forming a part of said web region; said web region further including inlaid threads connecting and fastening together the warp chains in said web region.

4,056,869

WELDED MUFFLER CLAMP

Benjamin J. Eisma, Jr., Grand Rapids, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Jan. 19, 1977, Ser. No. 760,812
Int. Cl.² B65D *63/00*
U.S. Cl. 24—277 **9 Claims**



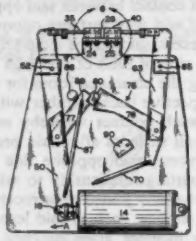
1. A clamp for tubular cylindrical members comprising, in combination, a U-bolt having a pair of parallel, threaded legs interconnected by a base portion of a semi-circular configuration, a sheet metal saddle bridging said legs having a pair of spaced, parallel elongated openings for receiving said legs, said saddle including an inner edge of a concave circular segment configuration in opposed relation to said base portion, spaced lateral edges and a rear edge intermediate said openings, a notch defined in said rear edge adjacent each lateral edge defining a nut engaging surface, said openings each intersecting a notch and nut engaging surface, said saddle comprising first and second portions of sheet metal folded back upon itself at said rear edge, said openings being defined by elongated semi-cylindrical recesses defined in said portions aligning to define cylindrical openings upon said portions being folded upon each other, weld means interconnecting said first and second portions at said lateral edges, and nuts threaded upon said legs engaging said nut engaging surfaces.

4,056,870

HAND HELD POWERED METAL CLINCHING TOOL

Elmer E. Biloff, 18289 Thomas Lane, Shafter, Calif. 93263

Filed Aug. 2, 1976, Ser. No. 710,547
Int. Cl.² B23P *11/00, 19/00*; B25B *25/00, 27/00*
U.S. Cl. 29—21.1 **7 Claims**



1. A hand held powered metal clinching device including a hand holdable base plate, a forming unit comprising axially aligned opposed punch and die members adapted to sequentially pierce, tab and swage contiguous sheets of metal disposed in a channel defined in said forming unit between said punch and said die, and a reciprocable power source for actuating and driving said punch and die members, the improvement comprising:

an integrated sequential timing and drive mechanism disposed between and interconnecting said forming unit and said power source so as to transmit power and movement from said power source to said forming unit to move said punch and said die in a predetermined sequence of integrated operations, said mechanism including,

a driver bar rotatably mounted to said plate and adapted to interconnect said punch and said power source,

a slave bar pivotally mounted to said plate in spaced relation to said drive arm and having an end thereof connected to said die, means biasing said slave arm to urge said die in a direction away from said punch, and

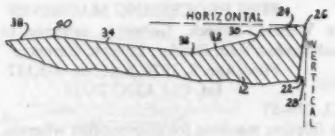
means interconnecting said driver bar and slave bar for transmission of timed power and motion therebetween, comprising a collapsible link, said link adapted to assume a rigid posture during the piercing, tabing and swaging motion of said forming unit, and adapted to collapse upon completion of swaging to cycle the forming unit to its starting position.

4,056,871

CUTTING INSERT

James S. Bator, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Oct. 21, 1976, Ser. No. 734,452
Int. Cl.² B26D *1/00*
U.S. Cl. 407—114 **17 Claims**



1. A molded indexable cutting insert formed of a hard wear resistant material and comprising a polygonal body having top and bottom faces wherein at least one of said faces comprises: at least two cutting edges defining a plane and formed by the juncture of said peripheral wall with said one of said faces; a land area extending inwardly toward the center of said polygonal body from said cutting edge; a fillet radius extending downwardly from the innermost edge of said land area; a first sub-

stantially planar wall portion extending from the bottom of said fillet and inclined downwardly from the plane of said cutting edges toward the center of said polygonal body in the range of from 5° to 15°; a second substantially planar wall portion extending from the inner edge of said first planar wall toward the center of said body and inclined upwardly toward the plane of said cutting edges in the range of from 5° to 30°, said second planar wall terminating in a central face area formed on the center portion of said polygonal body.

4,056,872

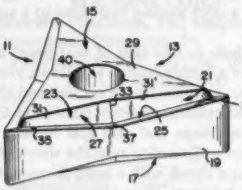
POSITIVE RAKE CUTTING INSERT FOR USE IN NEGATIVE RAKE HOLDERS

Heinz H. Seidel, Warren, Mich., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 619,209, Oct. 3, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,662

Int. Cl.² B26D *1/00*

U.S. Cl. 407—114 **4 Claims**



1. In a cutting insert adapted for forming positive back and side rake angles with the surfaces of a workpiece to be cut when said insert is mounted in a negative rake holder, wherein said cutting insert includes a body portion having substantially parallel upper and lower surfaces and peripheral side substantially perpendicular to said upper and lower surfaces, at least one channel extending from the entire outer edge of at least one planar peripheral side portion to the adjacent edge of at least one surface, said channel including an inner and an outer portion, said outer portion forming an angle less than ninety degrees with said peripheral side portion, and extending inwardly therefrom to adjoin said inner portion, said inner portion extending inwardly to adjoin said one surface at an angle greater than 90°, the improvement comprising:

said inner portion and said outer portion each consisting of two substantially straight face portions intersecting at a common juncture substantially centrally located within said channel, said straight face portions of both the inner portion and the outer portion of said channel extending downwardly toward the interior of the body portion of the insert to form an angle within the range of from about 121° to about 127° between said conjunctive straight face portions of said inner and outer portions of said channel, respectively.

4,056,873

COMPOSITE GUIDE ROLLER FOR A ROLLING MILL

Jacques Cassard, Grenoble; Jean-Michel Lachenal, Vizille, and Gerard Romagnolo, Eybens, all of France, assignors to Ugine Carbone, Grenoble, France

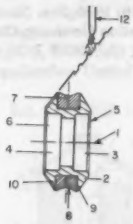
Filed Dec. 13, 1976, Ser. No. 749,835

Claims priority, application France, Dec. 19, 1975, 75.39792

Int. Cl.² B21B *31/08*

U.S. Cl. 29—132 **5 Claims**

1. A guide roller for supporting elongated products in a hot rolling mill including a hub, means defining an opening through said hub dimensioned to encircle a support shaft extending therethrough, means defining oppositely disposed recesses in said hub configured to receive supporting bearing devices therewithin, an annular ring supported on said hub and including means defining a peripheral groove to contact and guide the product, said hub being fabricated from a metallic material of lower density than steel, and said annular ring being fabricated from a hard refractory material selected from the



group consisting of metallic carbides, nitrides, carbonitrides, borides, ceramics based on metal oxides, and metal/metal oxide mixtures.

4,056,874

PROCESS FOR THE PRODUCTION OF CARBON FIBER REINFORCED MAGNESIUM COMPOSITE ARTICLES

Ilmar L. Kalnin, Millington, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 13, 1976, Ser. No. 686,192

Int. Cl.² B32B *15/14*

U.S. Cl. 75—.5 R **12 Claims**

1. In a process for the formation of a carbon fiber reinforced composite article wherein carbon fibers are incorporated in a magnesium containing metallic matrix comprising (a) providing said carbon fibers in contact with a molten magnesium containing metal while at a temperature above the melting point of said metal, and (b) cooling the resulting magnesium containing metal having said carbon fibers incorporated therein to a temperature below the melting point of said metal; the improvement comprising providing in said molten magnesium containing metal when contacted with said carbon fibers prior to said cooling a minor quantity of dispersed solid magnesium nitride sufficient to enhance the wettability of said carbon fibers by said magnesium containing metal.

4,056,875

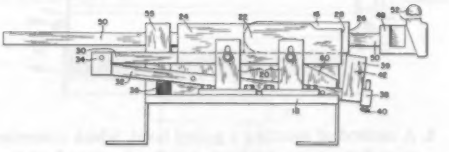
ASSEMBLING HAND GRIPS ONTO HANDLES

Edwin J. Buczak, 145 Wildwood Ave., Worcester, Mass. 01603

Filed July 2, 1976, Ser. No. 702,021

Int. Cl.² B23P *19/04*

U.S. Cl. 29—234 **5 Claims**



1. A machine for applying open ended grips to free ended handles comprising a base, means receiving a grip with an open end in a predetermined position, a sliding bar, means for holding an end of a handle on the sliding bar in a position to have a free end of the handle associated with the open end of the grip,

a guide aligning the free end of the handle with the open end of the grip, and means on the bar moving the guide out of the way as the bar is moved to thrust the handle into the grip,

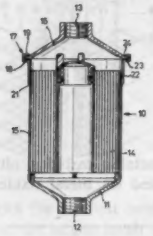
said guide also including means for engaging the sides of the grip to position the open end of the same laterally with respect to the free end of said handle.

4,056,876

METHOD OF MAKING A FILTER

Heinz Lämmermann, Nurnberg, Germany, assignor to Robert Boasch GmbH, Stuttgart, Germany

Filed Sept. 10, 1976, Ser. No. 722,214
Claims priority, application Germany, Oct. 25, 1975, 2547904
Int. Cl.² B65B 7/00
U.S. Cl. 29—469.5 9 Claims



1. A method of closing a metal filter can comprising the steps of sequentially:

providing around an annular shoulder adjacent the rim of an open side of said filter can an annular line of a hot-melt adhesive in nonliquid form;

applying a metal cover over said open side with its edge in contact with said annular line of adhesive in nonliquid form;

bending over said rim around said edge and thereby pressing said edge against said line and through said line against said shoulder;

heating the bent over rim to melt said adhesive; and

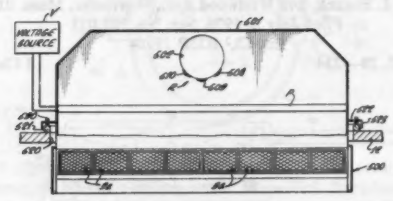
curing said adhesive.

4,056,877

METHOD OF INSTALLING APPARATUS FOR EXTRACTING GREASE AND SMOKE

Irvin R. Kuechler, San Bernardino, Calif., assignor to Vent-Cair, Inc., San Bernardino, Calif.

Division of Ser. No. 509,555, Sept. 26, 1974, Pat. No. 3,952,640. This application Aug. 25, 1975, Ser. No. 607,283
Int. Cl.² B23P 21/00
U.S. Cl. 29—469 14 Claims



1. A method of installing a grease hood, which comprises:

a. providing a restaurant kitchen ceiling having a hole therethrough sufficiently large to receive a premanufactured grease hood,

b. dropping said premanufactured grease hood from the exterior of said kitchen at least part of the way downwardly through said hole,

c. supporting said grease hood in a desired position in spaced relationship above a cooking appliance in said kitchen, with at least part of said grease hood below the elevation of said ceiling,

d. providing exhaust means which extend upwardly through said hole from said hood, and

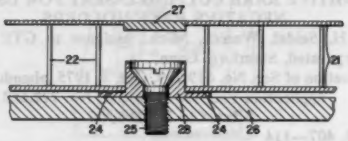
e. effecting closing of said hole around said exhaust means to prevent water from entering the kitchen.

4,056,878

METHOD OF FIXING A SANDWICH PANEL TO A SUPPORT

George Edward Woodley, Great Abington, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 611,730, Sept. 9, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,607
Claims priority, application United Kingdom, Sept. 17, 1974, 40372/74
Int. Cl.² B23P 19/00
U.S. Cl. 29—526 R 7 Claims



1. A method of fixing a sandwich panel having two spaced opposed skins and a core joining said skins to a support member, comprising:

inserting into a hole in one skin of said panel a cylindrical body portion of a ferrule having a hollow cylindrical body portion with an exterior flange on one end thereof and a seat within said cylindrical body portion at the same end as said exterior flange and said seat having an aperture therein of a size sufficient to pass the shank of a fastening element having a shank with a head thereon, the inserting of said ferrule being continued until said flange is against the outside of said one skin;

bonding said flange to the outside of said one skin;

placing the sandwich panel against the support member in the desired position with the skin of the panel having the flange of the ferrule bonded thereto against the support member; and

passing the shank of a headed fastening element having a shank with a head thereon through said aperture in said seat from inside said cylindrical body portion and into said support member until said head is against said seat and securing said shank to said support member;

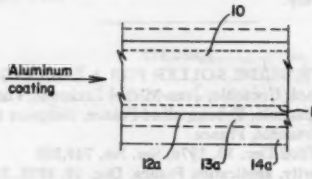
whereby there can be used a fastening element which has a shank which is only long enough to extend through said seat and to the desired depth into said support member.

4,056,879

METHOD OF FORMING SILICON SOLAR ENERGY CELL HAVING IMPROVED BACK CONTACT

Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Division of Ser. No. 614,619, Sept. 18, 1975, Pat. No. 3,990,097. This application July 14, 1976, Ser. No. 705,063
Int. Cl.² B01J 17/00
U.S. Cl. 29—572 9 Claims



1. A method of forming a silicon solar energy cell having junctions of opposite polarities, comprising heating a crystalline silicon wafer with a diffusant to form a front junction in a zone extending inwardly from the front surface of the wafer, a back junction extending inwardly from the back surface of the wafer and films of diffusant glass on said front and back surfaces, applying a coating of aluminum to the diffusant glass on the back surface of the wafer, and heating the wafer at a suffi-

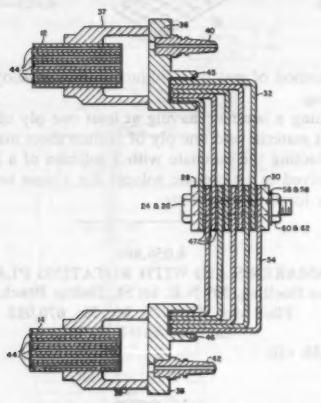
cient temperature until the aluminum has negated the polarity of the back junction and formed an aluminum-silicon junction in its place, said aluminum-silicon junction having a polarity of opposite sign to the polarity of the front junction, and until the glass film on the back surface of the wafer has become electrically conductive.

4,056,880

METHOD FOR CONNECTING DYNAMOELECTRIC MACHINE COILS

Richard E. Stewart, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 9, 1976, Ser. No. 703,738
Int. Cl.² H02K *15/00*
U.S. Cl. 29—596 2 Claims



1. A method of joining the end portions of a selected pair of half coils of a dynamoelectric machine one to another thereby establishing a mechanical and electrical union between the end portions of said selected pair of coils by means of a plurality of electrical conductors, each of said conductors including first and second end portions, said method comprising:

a. connecting the first end portion of each of a plurality of electrical conductors in electrical contact with a selected one of said half coil end portions;

b. connecting the first end portion of each of a second plurality of electrical conductors in electrical contact with the remaining half coil end portion of said selected pair of coils;

c. interleaving the second electrical conductor end portions of said first and second plurality of electrical conductors in electrical contact, one with another;

d. forming a metallurgical bond between said interleaved electrical conductor end portions;

e. compressing the interleaved electrical conductor end portions sufficiently to provide electrical integrity after said conductor end portions have been metallurgically bonded; and

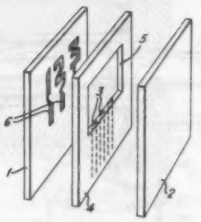
f. securing the interleaved electrical conductor end portions to maintain said compression.

4,056,881

METHOD OF MANUFACTURING ELECTRO-OPTICAL CELL

Ian Holt, Goodmayes, and Hugh Andrew Pincherle, New Barnet, both of England, assignors to The Rank Organisation Limited, London, England

Filed Apr. 9, 1976, Ser. No. 675,554
Claims priority, application United Kingdom, Apr. 9, 1975, 14545/75
Int. Cl.² G02F *1/13*
U.S. Cl. 29—592 R 8 Claims



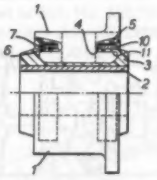
1. A method of manufacturing an electro-optical cell having parallel spaced-apart walls wherein at least one spacing element bonded to at least one insulating lamina, of an adhesive material which may readily be softened, is introduced between two cell walls and the at least one lamina is then softened to seal the cell walls and to cause the cell wall spacing to be determined substantially by the thickness of the spacer element or elements.

4,056,882

METHOD OF MAKING A DIMENSIONALLY STABLE COMMUTATOR

Robert Arthur Letts, Fleet, England, assignor to Airscrew Howden Limited, England

Continuation of Ser. No. 512,395, Oct. 4, 1974, abandoned. This application June 7, 1976, Ser. No. 693,675
Claims priority, application United Kingdom, Oct. 5, 1973, 46716/73
Int. Cl.² H01R *43/06*
U.S. Cl. 29—597 7 Claims



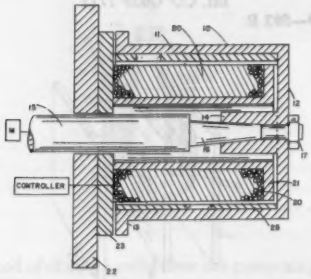
1. A method of making a high speed commutator, comprising embedding a number of conductive bars in insulating plastics material to form a moulded commutator while simultaneously providing the moulded commutator with at least one annular seat, and then subsequently placing a ring of high tensile material on the seat, stressing the ring in tension and thereby applying a radially inward load to each conductive bar which is three times greater than the centrifugal force on the bar at maximum running speed.

4,056,883

HEATED ROLL INDUCTIVE HEATER CONSTRUCTION

Kenneth H. Danner, Nashville, Tenn., assignor to Rosemount Inc., Eden Prairie, Minn.

Division of Ser. No. 475,457, June 3, 1974, Pat. No. 3,961,151.
This application Feb. 2, 1976, Ser. No. 654,164
Int. Cl.[2] H05B *3/18*
U.S. Cl. 29—611 3 Claims



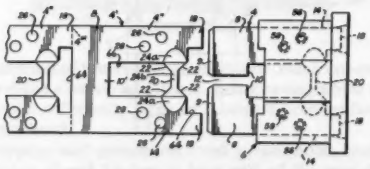
1. The method of constructing a coil for operation with heated rolls at high temperatures comprising the steps of providing a length of suitable heater wire having an inorganic insulation material surrounding said wire, helically wrapping said length of wire into loops arranged substantially in a layer about a central axis, filling the voids between each of the loops in the layer by forcing an insulating, hardening material against the loops until the voids are filled with said insulating, hardening material leaving a layer of said material over the loops in the layer, and adding additional layers of helically wound loops sequentially with each of the loops spaced from other loops and forcing said material into each layer to fill the voids between the loops of wire in each layer after each layer is wound and before another layer is wound, and to fill the voids between each of the layers with said insulating, hardening material.

4,056,884

METHOD OF MAKING A MINIATURE PLUG-IN FUSE

Harold L. Williamson, Northbrook, and Avinash P. Aryamane, Mount Prospect, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 610,978, Feb. 8, 1975, Pat. No. 3,962,782, which is a division of Ser. No. 432,980, Jan. 14, 1974, Pat. No. 3,909,767. This application June 8, 1976, Ser. No. 693,937
The portion of the term of this patent subsequent to June 15, 1993, has been disclaimed.
Int. Cl.[2] H01H *69/02*
U.S. Cl. 29—623 19 Claims



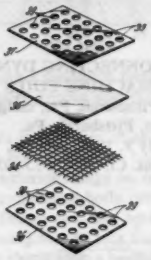
1. A method of making a plug-in fuse element comprising a pair of juxtaposed laterally spaced generally parallel terminals to be received by pressure clip terminals or the like, the terminals having current-carrying extensions at the inner end portions thereof which are to be interconnected by a fuse link, said method comprising: providing a sheet-like body of fuse metal, and blanking said sheet-like body of fuse metal to form parallel mutually coplanar juxtaposed laterally spaced terminal forming blade portions, current-carrying extensions at the inner end portions of the terminal forming blade portions thereof and a fuse-forming link portion interconnecting said current-carrying extensions, said fuse-forming link portion being substantially smaller in cross-sectional area than the other portions of the blanked body of fuse metal.

4,056,885

METHOD OF PREPARING LITHIUM-ALUMINUM ALLOY ELECTRODES

Bhaskara M. L. Rao, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 15, 1976, Ser. No. 750,965
Int. Cl.[2] H01M *4/04*
U.S. Cl. 29—623.1 13 Claims



1. A method of making a lithium-aluminum alloy electrode comprising:

a. forming a laminate having at least one ply of aluminum sheet material and one ply of lithium sheet material;

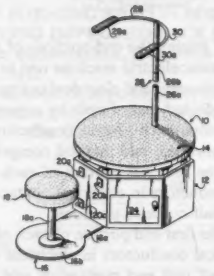
b. contacting the laminate with a solution of a lithium salt dissolved in an organic solvent for a time sufficient for alloy formation to occur.

4,056,886

DRESSMAKER'S AID WITH ROTATING PLATFORM

Sylvia Lee Doelling, 309 N.E. 1st St., Delray Beach, Fla. 33444

Filed Mar. 24, 1976, Ser. No. 670,092
Int. Cl.[2] A41H *21/00*
U.S. Cl. 33—10 2 Claims



1. A dressmaker's aid comprising, in combination, an enclosed base compartment, and a circular platform having a downwardly-depending skirt portion, said base compartment and said skirt portion respectively comprising first and second relatively telescoping sections, each of said telescoping sections including a plurality of upwardly-extending sidewalls, the outer faces of the sidewalls of said second relatively telescoping section being in face to face relatively parallel disposition with the inner faces of one each of said upwardly-extending sidewalls of said first relatively telescoping sections, a stool for the dressmaker fixed with respect to and spaced laterally out-

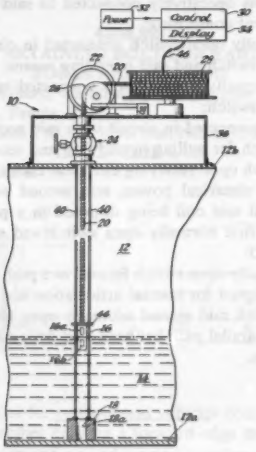
wardly of said first relatively telescoping section a said circular platform rotatably mounted with respect to and above said second telescoping section means for supporting and rotating said platform with respect to said said telescoping section means for raising and lowering said second telescoping section and its associated platform with respect to said first telescoping section, said platform rotating means comprising a reversible electric motor, electric switch means supported on said first telescoping section and within reach of the dressmaker seated on said stool for controlling both the operation and direction of turning of said rotatably mounted platform, said platform raising and lowering means comprising a reversible electric motor and electric switch means supported on said first telescoping section and within reach of the dressmaker seated on said stool for selectively controlling the raising and lowering of said platform with respect to said first telescoping section, the upper surface of said circular platform being of a larger diameter than said second telescoping section such as to extend laterally over the top of said second telescoping section.

4,056,887

DEVICE FOR THE MEASUREMENT OF LIQUID LEVEL

Thomas Lee Tucker, and Gilbert Halverson, both of West Palm Beach, Fla., assignors to Scientific Instruments, Inc., Lake Worth, Fla.

Filed July 12, 1976, Ser. No. 704,684
Int. Cl.[2] G01G *23/24*
U.S. Cl. 33—126.6 **18 Claims**



1. A machine for determining the distance from the bottom of a storage tank to the liquid-vapor interface of a liquid stored therein comprising:

a movable liquid-vapor interface probe in the storage tank, said probe including at least one electrically actuated medium sensing element;

a drive means including a cable, a motor means, and a motor control means;

said cable at least partially extending into said storage tank, said cable connected to said probe;

a measurement signal means; said motor means connected to said cable for lifting and lowering said cable and said probe within said storage tank, said motor means connected to said measurement signal means to provide at least one liquid-vapor interface position signal;

said motor control means connected to said motor, means and said liquid vapor interferface probe;

said measurement signal means connected to said motor control means for providing at least one liquid-vapor interface position signal;

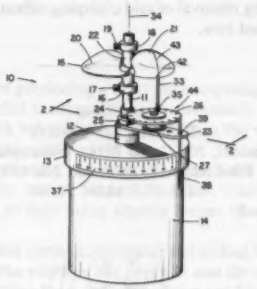
a sensing system connected to said cable for sensing the bottom of said storage tank, said sensing system connected to said motor control means and said measurement signal means to provide liquid-vapor interface position signal from the bottom of the storage tank.

4,056,888

DEVICE FOR MEASURING THE PITCH OF PROPELLER BLADES AND THE LIKE

Edward W. Hughey, Jr., 5827 Downing Drive, Indianapolis, Ind. 46208

Filed June 22, 1976, Ser. No. 698,357
Int. Cl.[2] G01B *3/56, 5/24*
U.S. Cl. 33—174 C **12 Claims**



1. A device for measuring the pitch of propeller blades and the like which comprises:

a base;

shaft means connected to said base for mounting a propeller coaxial with a base station line;

an arm mounted upon said shaft means, said arm being rotatable in a plane essentially normal to the base station line, said arm further being movable parallel to the base station line;

pin means attached to said arm for engaging the surface of a propeller mounted upon said shaft means;

linear measurement means for measuring the movement of said arm parallel to the base station line; and

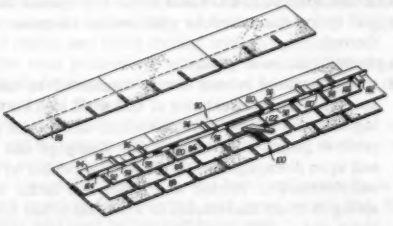
rotational measurement means for measuring the rotation of said arm in a plane essentially normal to the base station line.

4,056,889

STRIP SHINGLE ALIGNMENT FIXTURES

Larkin H. Barnett, III, Norfolk, Va., assignor to Virginia National Bank, Norfolk, Va.

Continuation-in-part of Ser. No. 610,727, Sept. 5, 1975, abandoned. This application July 29, 1976, Ser. No. 709,683
Int. Cl.[2] G01B *3/30*
U.S. Cl. 33—188 **30 Claims**



1. An improved alignment fixture for use with asphalt composition strip shingles for roofing and siding, comprising:

an elongated horizontal alignment guide for simultaneously

supporting the lower edges of a plurality of strip shingles to be laid;

a plurality of selectively, horizontally adjustable spacer means attached to said guide for spacing said strip shingles at predetermined itervals along said guide;

clamping means for attaching said guide to a previously laid row of strip shingles in parallel relation thereto; and

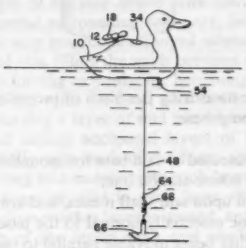
means joining said clamping means and said guide for permitting selectively adjustable horizaontal movement of said guide relative to said clamping means while said clamping means is attached to said previously laid row, whereby said strip shingle to be laid may be properly positioned relative to said previously laid row without requiring removal of said clamping means from said previously laid row.

4,056,890

TETHERED DECOY

Gary R. Dembski, 305 Grand Blvd., Wauconda, Ill. 60084

Filed Mar. 10, 1976, Ser. No. 665,685
Int. Cl.² A01M *31/06*
U.S. Cl. 43—3 **1 Claim**



1. In a decoy with an outer shell having the general appearance of a duck, the improvement comprising:

means disposed within said shell for playing a phonograph record; and

a tether line connected to said decoy;

an anchor; and

an expandible and contractible coil spring connected between said anchor and a free end of said tether line,

said playing means comprising:

a rotatably mounted first gear having a face adapted to receive said phonograph record; and

a second gear mounted for engagement with said first gear;

a spring motor operable to cause rotation of said second gear; and

means accessible from the exterior of said shell for winding said spring motor;

a ratchet adapted to have said tether line wound thereon;

a coil spring connected to said ratchet to cause rotation thereof;

a pivotally mounted pawl;

a spring-mounted release button connected to said pawl accessible from the exterior of said shell, said button having lock and release positions which causes said pawl to pivot to respectively engage and disengage said ratchet and upon disengagement to enable said ratchet to be manually rotated to unwind said tether line or for said coil spring to rotate said ratchet to wind said tether line thereabout and

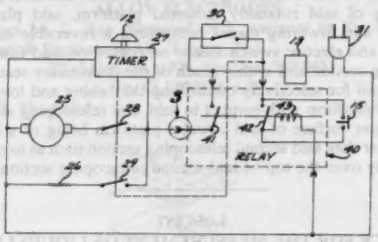
a fixedly mounted dowel in slidable engagement with said pawl for pivoting said pawl to disengage said ratchet when said release button is pushed against the bias of its spring-mounting.

4,056,891

SEQUENTIAL SWITCHING DEVICE

Billy R. Rayburn, Rossmore, Calif., assignor to Billy R. Rayburn; Paul T. Mu and Alfred F. Hayes, all of Signal Hill, Calif.

Filed May 23, 1975, Ser. No. 580,229
Int. Cl.² F26B *11/04*
U.S. Cl. 34—55 **1 Claim**



1. In an automated appliance including a door for receiving articles, a source of electrical power, a door switch connected between said source of electrical power and adapted to be articulated to a closed state when said door is closed, and operating means operatively connected to said door switch, the improvement comprising:

a first normally open switch connected in circuit between said door switch and said operating means;

a second normally open switch connected in circuit with said door switch;

coil means connected in circuit with said second normally open switch for pulling in said first and second normally open switch upon receiving electrical excitation from said source of electrical power, said second normally open switch and said coil being disposed in a parallel circuit with said first normally open switch and said operating means; and

a third normally open switch formed as a push-to-close palm button adapted for manual articulation and connected in parallel with said second normally open switch for providing a parallel path between said door switch and said coil means.

4,056,892

ENGINEERING AND EDUCATIONAL TABLE AND METHOD OF USE

Jimmie P. Atencio, 18650 Rea Ave., Aromas, Calif. 95004

Filed Apr. 16, 1976, Ser. No. 677,771
Int. Cl.² G09B *25/06*
U.S. Cl. 35—10 **16 Claims**

1. A landscape instruction and design table comprising in combination;

a generally rectangular box-like container having a bottom and vertically extending sides terminating at an upper edge for supporting a removable top;

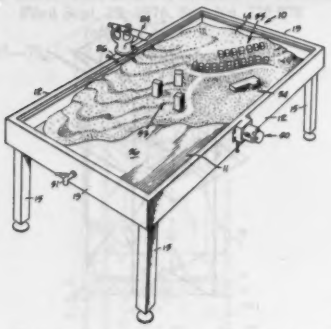
a removable top plate providing a plane working surface adapted to rest on said upper edge;

a quantity of non-fluid material disposed in said container for shaping into simulated landscapes;

distance measuring means associated with said container for measuring distances of selected points within said container from each other and from a base reference point; and,

angle measuring means comprising a transit associated with

said container and sealed for functioning therewith for measuring vertical and horizontal angles betwen points



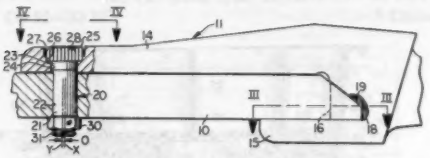
within said container and between said points and a reference axis.

4,056,893

ECCENTRIC RETAINING BOLT FOR EARTHWORKING TOOLS AND METHOD

Kaarlela O. Willard, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 13, 1976, Ser. No. 657,987
Int. Cl.[2] E02F 9/28
U.S. Cl. 37—142 R 7 Claims



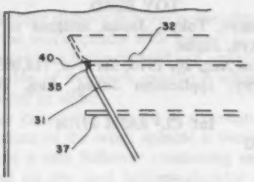
1. A work tool for construction vehicles comprising
a support member defining a forward edge thereon,
an adapter mounted on said support member and defining a bearing surface thereon maintained in bearing contact with the forward edge of said support member,
an earthworking tip mounted on a forward end of said adapter,
means, including a bolt having eccentric cam means formed thereon, detachably mounting said adapter on said support member and for providing and maintaining the bearing surface of said adapter in bearing contact with the forward edge of said support member said cam means comprising a cylindrical cam having a longitudinal axis thereof disposed in offset relationship relative to a longitudinal axis of a shank of said bolt and disposed within a bore formed in said adapter, and anti-rotation means for preventing said bolt from rotating relative to said adapter comprising a head secured on a first end of said bolt, a plurality of teeth formed circumferentially on the periphery of said head to project radially outwardly therefrom and a plurality of notches formed circumferentially within a counterbore defined within the bore formed in said adapter, said teeth disposed within said notches for preventing said bolt from rotating relative to said adapter.

4,056,894

METHOD OF PRODUCING A CARD FILE

Edward K. Sundstrom, Box 338, Pennington, N.J. 08534

Filed Jan. 30, 1976, Ser. No. 653,898
Int. Cl.[2] B42F 15/00
U.S. Cl. 40—104.03 11 Claims



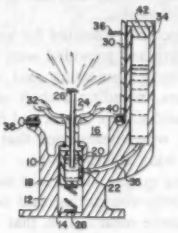
1. A method of producing a card file comprising:
a. cutting parallel tandem slits in a substantially rigid sheet,
b. the slit length being slightly shorter than the width of the cards to be inserted therein,
c. providing indenting means at the ends of the slits,
d. placing cards, one or more to each slit, which will bow slightly due to their being slightly longer than the length of the slits,
e. pressing on the cards in the center and sliding the pressure out toward the edges of the cards to seat the cards in the slit and indenting them to form holding and hinge points in the cards.

4,056,895

NOVELTY TOY

Antonio J. Terralli, 4142 N. Campbell, Chicago, Ill. 60618

Filed Nov. 2, 1976, Ser. No. 738,108
Int. Cl.[2] A63H 33/00
U.S. Cl. 46—1 R 6 Claims



1. A novelty toy formed in the shape of a miniature toilet bowl comprising:
a recessed bowl having a stand attached thereto;
a longitudinal recess formed within said stand and communicating with the bowl recess;
a piston having a cavity formed therein, said piston being disposed and longitudinally movable within said longitudinal recess, and being formed with an opening;
a hollow stem protruding outwardly from said piston and inwardly into said cavity, and formed with a nozzle at the outward end thereof;
a compression spring disposed within said longitudinal recess and in contact with said piston for urging the latter to move outwardly from said bowl;
a cover hingeably attached to said bowl and normally in a closed position for covering said bowl recess and for keeping said stem within said bowl; and
means for filling said cavity with pressurized liquid through said opening upon an outward movement of said piston, whereby, upon said cover being lifted from said bowl, said stem moves in an upward direction, and said pressurized

liquid is dispensed from said nozzle upon said cavity having been filled with the liquid.

4,056,896

TOY BIRD

Hideyasu Karasawa, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Aug. 26, 1976, Ser. No. 718,095

Claims priority, application Japan, Aug. 29, 1975, 50-120269[U]

Int. Cl.² A63H *11/04*

U.S. Cl. 46—132 **6 Claims**

1. A toy bird, comprising:

a housing,

sheave means mounted for rotation within said housing and being provided with two separate posts of different dimension,

a cord having two pieces, one of said pieces wound around one of said posts while the other of said pieces is wound around the other of said posts, said cord extending outwardly of said housing such that as said cord is pulled said sheave means rotates,

wing means operably mounted for movement with respect to said housing and provided with slots,

means operatively connecting said wing means and said sheave means, including a shaft offset from the axis of rotation of said sheave means and extending through said slots of said wing means such that as said sheave means rotates said wing means moves,

noise producing means within said housing, and

means operatively connecting said noise producing means and said sheave means such that as said sheave means rotates, said noise producing means operates.

4,056,897

PLANTER DESIGN AND CONSTRUCTION

Mary Ellen Pearce, and John Scott Pearce, both of 8800 Burbank Road, Annandale, Va. 22003

Filed Dec. 22, 1975, Ser. No. 643,233

Int. Cl.² A01G *9/02*

U.S. Cl. 47—39 **15 Claims**

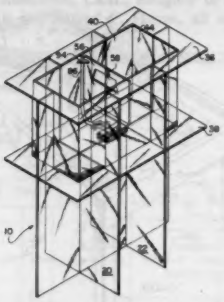
1. A planter comprising:

A. a plant container including interconnected sides and a bottom, all being formed of rigid transparent plastic material, said container being adapted for at least partly containing therein a plant together with plant life supporting material;

B. said container being waterproof for containment of water therein;

C. a hollow filter box with closed sides and a closed top and having perforations in the bottom thereof;

D. said filter being supported above the inner side of said container bottom and beneath plant life supporting material in said container; and



E. means placing said filter box in fluid communication with the planter exterior for controlling the amount of water within said container.

4,056,898

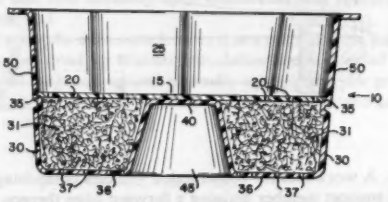
WATER ACTUATED PLANT FERTILIZING DEVICE

Jacqueline I. Brucato, and Steve J. Brucato, both of 3712 Downers Drive, Downers Grove, Ill. 60515

Filed May 10, 1976, Ser. No. 684,926

Int. Cl.² A01G *29/00*

U.S. Cl. 47—48.5 **4 Claims**



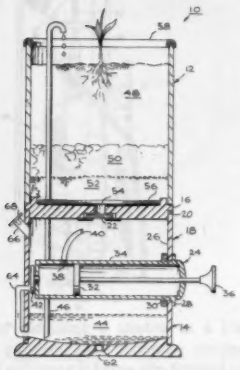
1. A fertilizer container for placement on the surface of the soil in close proximity to the root system of a plant, comprising, in combination, a cup having outer walls, a porous bottom, said outer walls tapering inwardly toward said bottom, the central portion of said porous bottom portion being a raised broad upper support surface, an interior shoulder on a midsection of said outer walls, a flat substantially uniformly perforated cover plate, said cover plate having a periphery positionable on said interior shoulder and substantially conforming to said outer wall, said raised upper support surface supporting a substantial portion of said cover plate and said shoulder supporting said periphery of said cover plate thereby providing a broad support base for said cover plate and separating said cup into a lower compartment and an upper compartment, said lower compartment being substantially donut-shaped and said upper compartment being for the reception of water, whereby the water received in said upper compartment may seep uniformly into said lower compartment, where at least a portion of said fertilizer is dissolved and passes, through said porous bottom onto the soil supporting the container at a controlled rate.

4,056,899

LIQUID-RECYCLING PLANTER

Dolores R. Close, 16003 Ludlow, Granada Hills, Calif. 91344

Filed Sept. 23, 1976, Ser. No. 725,978
Int. Cl.[2] A01G *27/00*
U.S. Cl. 47—79 5 Claims



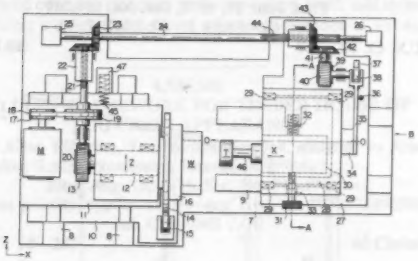
4. Apparatus according to claim 1 in which said liquid delivery means includes a perforated hollow cap.

4,056,900

CAM MACHINING APPARATUS

Takashi Ishida, Nagoya, Japan, assignor to Okuma Machinery Works Ltd., Nagoya, Japan

Filed Dec. 29, 1975, Ser. No. 645,221
Claims priority, application Japan, Dec. 28, 1974, 50-1413; Oct. 24, 1975, 50-128693
Int. Cl.[2] B24B *5/06, 17/00*
U.S. Cl. 51—33 W 5 Claims



1. A cam machining apparatus wherein a rotating tool is used in performing work controlled by profiling of a master cam, characterized in that said apparatus comprises

a work spindle rotatably mounted on a work head and adapted to be fitted with a work piece for rotation therewith at a predetermined number of rotations;

an oscillating cam mounted on a tool holder and rotating in a certain proportion with the rotation number of said work spindle;

a swivel member swiveling with the rotation of said oscillating cam;

a tool spindle unit having a rotating tool, provided on said swivel member and being slidable perpendicularly to the swiveling axis of swivel member;

a carriage supporting one of said work head and said tool for sliding movement perpendicular to the axis of said spindle;

a master cam being rotated in a certain proportion with the rotation of said work spindle, and relatively changing the distance between the axial line of said work spindle and the axial line of said rotating tool; and

the rotating tool is constantly oscillated about the working point during work by sliding said tool spindle unit whereby the outer periphery of the rotating tool can be aligned with the center of swiveling of said swivel member;

said tool holder slidably moving perpendicularly to the axial line of the work spindle with respect to said carriage and said master cam being rotated in a certain proportion with the rotation of the work spindle is adapted to cause said tool holder to slide;

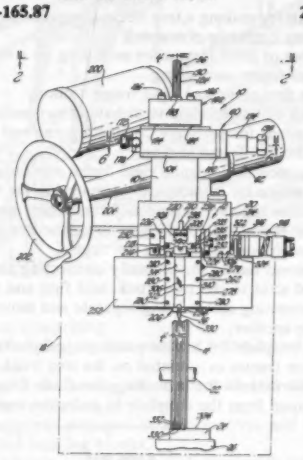
said master cam being rotated in a certain proportion with the rotation of the work spindle is mounted on said carriage and a cam follower contacting said master cam is mounted on the tool holder, thereby causing the tool holder to slidably move perpendicularly to the axial line of the work spindle with the rotation of said master cam.

4,056,901

DRESSER AND GRINDING MACHINE THEREFOR

Marvin R. Anderson, Grosse Pointe Shores, and Harald N. Jungesjo, Rochester, both of Mich., assignors to Anderson-Cook, Inc., Fraser, Mich.

Division of Ser. No. 559,945, March 19, 1975, Pat. No. 4,008,702. This application Feb. 27, 1976, Ser. No. 662,076
Int. Cl.[2] B24B *49/18*
U.S. Cl. 51—165.87 23 Claims



1. A grinding machine and dresser therefor comprising: a base; a carriage for rotatably supporting a grinding wheel so as to grind a workpiece, the carriage being mounted on the base for rectilinear movement with respect thereto; a dresser mounted for rectilinear movement with respect to the carriage in a direction parallel to the movement of the carriage on the base, the dresser including a tool holder for a cutting tool that dresses the wheel; an elongated drive screw having coaxial right and left-hand threaded portions of the same pitch spaced axially along the length thereof, the drive screw also having an intermediate portion between the right and left-hand threaded portions thereof; a bearing coupling the intermediate portion of the drive screw with the carriage to move the carriage along the base upon axial movement of the screw; a first nut fixed to the base and threadingly receiving one threaded portion of the screw so that screw rotation moves the screw axially to drive the carriage along the base; and a second nut fixed to the dresser and threadingly received by the other threaded portion of the drive screw on the opposite side of the bearing from the first nut so that the screw rotation moves the dresser relative to the carriage the same distance the carriage moves relative to the base and in the same direction, the dresser thereby moving

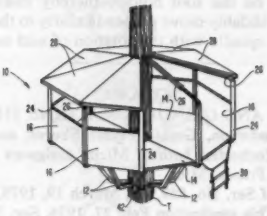
twice as far as the carriage relative to the base for any given amount of screw rotation so a cutting tool held by the tooth holder of the dresser dresses the grinding wheel in a precise manner that maintains the same cutting depth of the workpiece before and after dressing.

4,056,902

TREE HOUSE KIT

William H. Ziegler, Jr., Bedford, Pa., assignor to Hedstrom Company, Bedford, Pa.

Filed Apr. 12, 1976, Ser. No. 676,338
Int. Cl.[2] E04B *1/34*
U.S. Cl. 52—73 **14 Claims**



1. A kit for making a tree house comprises in combination a packaging container containing

A. a set of floor frames for mounting on a tree trunk, each floor frame comprising
   1. a first elongated rigid frame section,
   2. an elongated rigid strut having two ends,
   3. means for pivotally connecting one end of the strut to the first frame section,
   4. a second elongated rigid frame section, and
   5. **means for telescopically connecting the two frame sections together beyond said connecting means,**

B. first means for pivotally securing the free end of said first floor frame section to a tree trunk,

C. second means for pivotally connecting the other end of said strut to the tree trunk, said first and second pivotal connecting means being separate and movable relative to one another,

D. a template for a floor panel shaped to rest on the set of floor frames as mounted on the tree trunk, and

E. instructions for mounting the floor frames and panels shaped from the template to make the tree house.

4,056,903

WALL SUPPORT MECHANISM FOR ADJUSTING THE VERTICAL ORIENTATION AND HEIGHT OF A WALL MEMBER

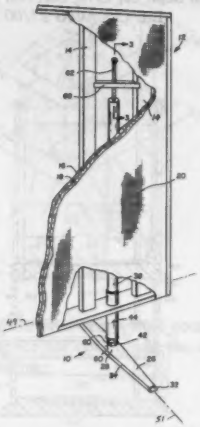
Joseph V. Guarnere, Rochester, N.Y., assignor to TIW Industries, Inc., Rochester, N.Y.

Filed June 21, 1976, Ser. No. 698,486
Int. Cl.[2] E04B *2/72*; A47G *5/00*
U.S. Cl. 52—122 **11 Claims**

1. A support mechanism for vertically supporting a wall member such as an acoustical screen, room partition, or the like substatially perpendicular to a reference horizontal floor comprising:

a foot member mountable on a non-horizontal floor and having a central plate portion in substantially parallel relation thereto; and

a unitary conduit coupled to the wall member and having one end of said unitary conduit rigidly secured to said unitary conduit, said one end having a surface lying in a plane inclined to the axis of said conduit, said surface of said one end abutting said central plate portion of said foot member for vertically orienting said conduit and a wall member supported thereby in a plane substantially perpendicular to said reference horizontal floor upon rotatable movement of said conduit and said one end thereof on said central plate portion of said foot member to a selected position;



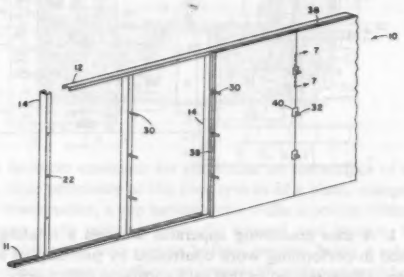
said conduit further being releasably secured to said foot member in said selected position.

4,056,904

WALLBOARD APPLICATION METHOD AND APPARATUS THEREFOR

Jack A. Dawdy, Kenmore, N.Y., assignor to National Gypsum Company, Buffalo, N.Y.

Filed June 10, 1976, Ser. No. 694,539
Int. Cl.[2] E02D *35/00*; E04B *2/00*
U.S. Cl. 52—127 **10 Claims**



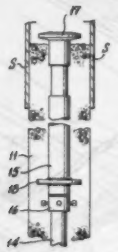
1. In combination with wallboard being adhered to wallboard supports, a temporary holder for wallboard comprising an elongate rod having one end affixed relative to one of said wallboard supports, said rod extending outward from said support between the abutting edges of two adjacent wallboards, and a retainer plate disposed firmly against the edges of said adjacent wallboards, said retainer plate being urged against said wallboard edges by means engaging said rod, said engaging means comprising at least one slit extending away from an opening, said slit having a width less than the width of the cross section of said rod and said opening being larger than said rod, said rod being grasped by said rod engaging means in a manner preventing relative movement of said rod engaging means away from said wallboard.

4,056,905

PRE-STRESSED CONCRETE STRUCTURES

Walter Thorpe, Stockport, England, assignor to Simonbuild Limited, Stockport, England

Filed Mar. 19, 1976, Ser. No. 668,426
Int. Cl.[2] E04C *3/10*; E02B *1/00*
U.S. Cl. 52—223 R 8 Claims



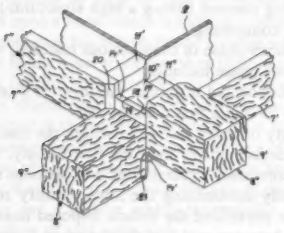
6. Equipment for installing a tendon in a longitudinally extending duct in an elongated generally vertical concrete structure while said structure is being slip-formed comprising a tubular member adapted to be inserted to form the uppermost part of said duct, said member having outwardly extending abutment means at or near its lower end and being of such length that its upper end terminates at the level where the upper end of a tendon is to be anchored with said abutment means so spaced below said upper end of the tubular member that, at the time the upwardly growing concrete structure reaches a height in the vicinity of said upper end, said abutment means is located within the structure at an operative level where the concrete has sufficiently hardened and developed sufficient strength to enable forces necessary to install and support a tendon in the duct to be transmitted through the tubular member and abutment means to be distributed in the developed concrete structure at that operative level, said member having a bearing plate for a prestressing tendon at its said upper end.

4,056,906

BUILDING FRAMEWORK FOR TIMBER HOUSE OF LOG-CABIN APPEARANCE

Carry Allon Elfström, Landskrona, Sweden, assignor to Area Holding S.A., Luxembourg, Luxembourg

Filed Aug. 13, 1976, Ser. No. 714,278
Claims priority, application Sweden, Aug. 14, 1975, 75090993
Int. Cl.[2] E04B *1/10*
U.S. Cl. 52—233 16 Claims



1. A building framework comprising:

two mutually orthogonal walls meeting at a corner, one of said walls comprising a set of coplanar superposed first boards forming a first outer wall surface, the other of said walls comprising a set of coplanar superposed second boards forming a second outer wall surface, all said first and second boards being of the same height, said second boards being vertically offset by half said height from said first boards; and

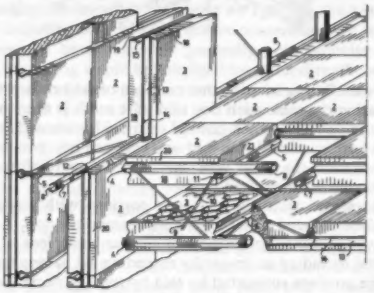
first and second junction blocks with projecting heads substantially as high as said boards and with reduced necks not more than half as high as said boards, said first and second junction blocks being alternately superposed by their necks at said corner on the levels of said first and second boards, respectively, said first boards having tongues disposed alongside the necks of said first junction blocks and held in position by the heads of said second junction blocks, said second boards having tongues disposed alongside the necks of said second junction blocks and held in position by the heads of said first junction blocks, said tongues being narrower than said boards and recessed from said outer wall surfaces, said heads and said boards adjoining one another along beveled flanks.

4,056,907

BUILDING BLOCKS AND SUPPORT STRUCTURE

Hans Dolder, Kloten, Switzerland, assignor to Adelheid Dolder, Kloten, Switzerland

Continuation of Ser. No. 450,162, March 11, 1974, abandoned.
This application Oct. 6, 1975, Ser. No. 620,217
Int. Cl.[2] F04B *1/00*
U.S. Cl. 52—266 15 Claims



1. A structure comprising

building blocks lying together without being bound by motar,

said building blocks having side walls with said side walls having grooves therein,

chords of supports arranged in said grooves and located between said building blocks,

said supports being truss girders including main and auxiliary supports with said auxiliary supports extending through said main supports, wherein the chords of a truss girder each comprise a hexagonal profile member, wherein the cross-section of said groove at said building block is bounded by one-half of said hexagonal profile member.

the groove in one of said side walls of a building block being offset by the height of the related chord with respect to the groove in that side wall which is located perpendicular to the first-mentioned side wall.

4,056,908

COMPOSITE CONCRETE SLAB AND STEEL JOIST CONSTRUCTION

Ira J. McManus, 39 Lincoln Ave., Florham Park, N.J. 07940

Filed Aug. 7, 1975, Ser. No. 602,711
Int. Cl.[2] E04B *5/16*; E04C *3/20*
U.S. Cl. 52—334 5 Claims

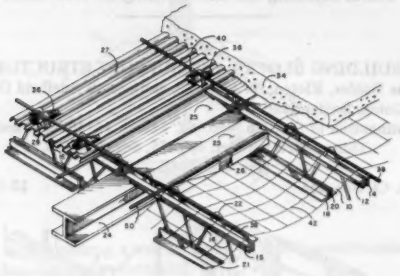
1. In a composite open-web steel joist and concrete slab construction, the combination comprising:

at least one open-web joist member having a zig-zag bent metal webbing member, and secured top and bottom chords; said zig-zag bent rod webbing member having a

substantially uniformly spaced series of upper extending apex portions with respect to the said top chord to which it is affixed forming a plurality of shear members extending upwardly from said chord at said portions; a corrugated solid sheet metal formwork member having a substantially flat top and bottom portions received in seating engagement upon said joist top chord and having a plurality of apertures therein for the through passage of said upwardly extending shear members;

said top chord being displaced somewhat downwardly from the upper ends of said apex portions of said bent rod web and being secured to said webbing members and acting in combination with said apex portions as shear members in said composite steel joist and concrete slab construction;

a rod affixed to the apices of said shear members and extending along the longitudinal axis of said joists; and



a wire mesh draped over one or more of said rods prior to pouring concrete such that said wire mesh is near the top of the concrete when poured over said joists and is near the bottom of said slab midway between any two of said joists such that said wire mesh serves to reinforce the concrete when poured; and

wedge means securing said apex portions with respect to said corrugated metal formwork member;

said wedge means comprising an angular bent piece of sheet metal including an upwardly extending leg having tapered edge portions supported by said bottom leg portion defining a substantially triangular shaped cross-section wedge means;

a poured concrete slab upon said formwork members and encasing said shear members, said rod, and said mesh.

4,056,909

SURFACE WATERSTOPS

Gerald Bernardo, Henlow Village, and Richard Malcolm Clive Jackson, Cinderford, both of England, assignors to Schlegel (U.K.) Limited, Leeds, England

Continuation of Ser. No. 509,303, Sept. 25, 1974, abandoned. This application Nov. 12, 1975, Ser. No. 631,047

Int. Cl.[2] E04B *1/68;* **B32B** *3/30*

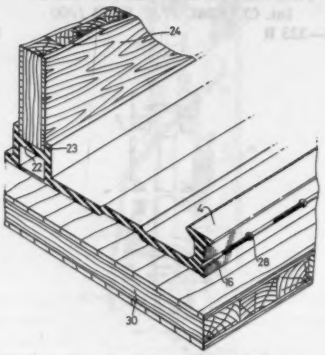
U.S. Cl. 52—396 **10 Claims**

1. A surface water stop for forming a waterproof joint at the face of two pours of cementitious materials and adapted to be mounted on a supporting surface by fixing pins having a head thereon or clips, said water stop comprising:

a. a longitudinally extending strip of a selected width of rubber or plastic material having a base portion with at least a planar portion thereof adapted to be mounted on said supporting surface, said base portion having a longitudinally extending lower wall surface;

b. a longitudinally extending keying formation on each side of the center line of said base portion, each of said keying formations laterally extending from one face only of said base portion and having a side wall surface laterally extending transverse to the plane of said base portion; and

c. longitudinally extending inclined guide slot located adjacent each longitudinal edge of said base portion in one of said lower and side wall surfaces, said slot having opposed, spaced-apart surfaces spaced laterally and widthwise along one of said side and lower wall surfaces respectively and arranged at an acute angle to said plane of said base portion for receiving and guiding said fixing pins or clips at said acute angle into said supporting surface for



holding said said waterstop against said supporting surface and preventing said waterstop from moving relative to said fixing pins or clips and said supporting surface during pouring of said cementitious material.

4,056,910

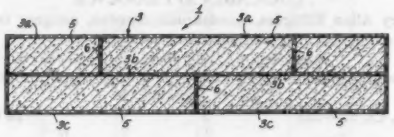
STRUCTURAL BUILDING ELEMENT

Carl C. Hiatt, and Nils F. Larson, both of Winston-Salem, N.C., assignors to Hiatt-Larson Corporation, Winston-Salem, N.C.

Filed Oct. 24, 1975, Ser. No. 625,478

Int. Cl.[2] E04B *5/00*

U.S. Cl. 52—600 **22 Claims**



1. A building element having a high structural load bearing capacity and comprising:

a. a continuous phase of cementitious material, wherein said continuous phase includes:

b. an interconnected matrix in the form of a cellular structure and having a first density, and

c. a plurality of zones dispersed within the matrix having a second density lower than the first density, wherein the matrix comprises a plurality of wall sections substantially completely surrounding the lower density zones with at least one portion of the matrix disposed interiorly of the element between said low density zones for interconnecting opposed wall sections of the matrix, and

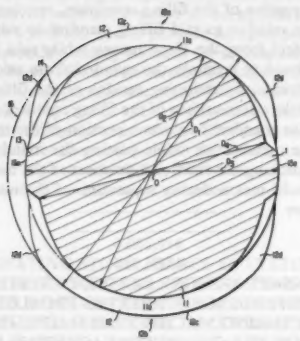
d. a common cementitious bond between the wall sections of the matrix, the interiorly disposed interconnecting portion of the matrix, and the lower density zones for producing a synergistic relationship imparting increased compressive strength and minimization of fracture propagation throughout the element.

4,056,911

STEEL BAR FOR CONCRETE REINFORCEMENT HAVING A NON-CIRCULAR CROSS-SECTION

Yoshio Tani, Kobe, Japan, assignor to Kobe Steel, Ltd., Kobe, Japan

Filed June 23, 1976, Ser. No. 699,224
Claims priority, application Japan, June 23, 1975, 50-77724
Int. Cl.[2] E04C *5/03*
U.S. Cl. 52—738 9 Claims



1. A steel bar for concrete reinforcement, having a noncircular cross section and including a core portion, and having a longitudinally extending axis, which comprises:

two sets of transverse ribs disposed respectively upon first diametrically opposite surface portions of the core of the steel bar, each set consisting of a number of transverse ribs of a lug-forming projection type disposed at a position corresponding to every pre-selected pitch in the longitudinal direction of the steel bar and extending therefrom in planes substantially transverse to the core;

a pair of longitudinal ribs disposed on second diametrically opposite surface portions of the core at the intermediate positions between said sets of transverse ribs and extending from the core linearly in the longitudinal direction thereof;

the outer portion of each of said longitudinal ribs being disposed upon a locus which is located a distance from the axis of said steel bar which lies in a range which extends between being equal to or less than the distance between said axis and the outer circumferential surface portions of said first diametrically opposite surface portions of the core located at the remotest position from said axis;

the major central portion of the outer surface of each of said transverse ribs being disposed upon a locus having a larger diameter than the locus having the axis of the steel bar as its center and a surface which tangentially contacts the outer surface of said core; and

the outer surface of the wing portion of each of said transverse ribs being disposed in such a manner that the distance from the axis is reduced progressively towards the outer portion of said longitudinal ribs;

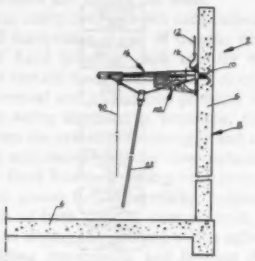
whereby said transverse ribs can mate with a female helical thread of a corresponding pitch in a nut, coupler or anchor sleeve.

4,056,912

METHOD FOR RELEASING TILT-UP PANEL HOISTING MEMBER

James E. Case, and Richard L. Ruppert, both of Sparks, Nev., assignors to The Dayton Sure-Grip & Shore Company, Miamisburg, Ohio

Division of Ser. No. 578,552, May 19, 1975, Pat. No. 3,997,959.
This application Dec. 16, 1976, Ser. No. 751,536
Int. Cl.[2] E04B *1/00*; E02D *35/00*; E04H *12/20*
U.S. Cl. 52—745 7 Claims



1. A method for erecting a tilt-up building panel from a generally horizontal position into a generally vertical position comprising the steps of anchoring an insert in the panel, the insert including a threaded aperture communicating with the exterior and having an axis generally perpendicular to the panel, providing a split bolt defined by a plurality of cooperating bolt segments having an exterior thread complementary to the threaded aperture, the split bolt being formed so that it can be axially inserted into the aperture when the segments are proximate to each other, inserting wedge means between the bolt segments to spread the segments and engage them with the threaded aperture, thereby locking the bolt to the insert, raising the panel by engaging the bolt and lifting it until the panel is in its upright position, fixing the panel in its upright position, and withdrawing the bolt from the ground by positioning a linearly reciprocable release member in substantial alignment with the bolt, said positioning being performed by raising the release member from about ground level to the level of the insert by mounting it to an extension and raising the extension into an upright position until the release member is aligned with the insert, engaging the wedge means with the release member and operating the release member from the ground to move it away from the panel to thereby move the wedge means out of its engagement with the bolt segments, whereby the bolt segments can be collapsed and removed from the threaded aperture without requiring the operator to climb up on the panel.

4,056,913

METHOD OF PACKAGING AND SHIPPING BULK MATERIAL USING REUSABLE OUTER SHELL

Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 557,420, March 11, 1975, Pat. No. 4,040,558. This application Oct. 29, 1976, Ser. No. 736,987
Int. Cl.[2] B65B *1/00*
U.S. Cl. 53—27 6 Claims

1. A method of packaging and shipping a bulk material product in a combination container comprising the steps of:

a. providing an inner paperboard container having at least one product receiving cell for the combination container;

b. providing at least one removable outer paperboard shell for the combination container designed with an open bottom to be fit over and to surround said inner container to add stability thereto;

c. filling said product receiving cell with a bulk material product at an original location, said inner container and

said outer shell being constructed so that any frictional holding forces between the walls thereof are less than the combined weight of said inner container and the products in said product receiving cell;

d. shipping said inner container with said product and with said outer shell fit over and surrounding the same to a remote location;

e. lifting said outer shell upward from said inner container and the product to remove the outer shell;

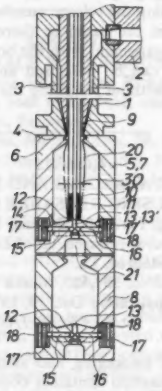
f. reshipping the removed outer shell back to its original location while allowing said inner container and the product to remain at the remote location for storage and use purposes; and g. fitting said outer shell over another inner container having at least one product receiving cell.

4,056,914

METHOD AND APPARATUS FOR REMOVING RESIDUE OF FILLING MATERIAL IN MACHINES FOR MANUFACTURING FILLED PLASTIC CONTAINERS

Reinhold Mnilk, Dortmund; Manfred Kurreck, Bochum-Weitmar, and Wolfgang Tiede, Dortmund, all of Germany, assignors to Holstein & Kappert Aktiengesellschaft, Dortmund, Germany

Filed Sept. 26, 1975, Ser. No. 617,180
Claims priority, application Germany, Sept. 27, 1974, 2446206
Int. Cl.[2] B65B *1/04*
U.S. Cl. 53—35 5 Claims



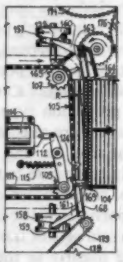
1. A method for removing undesired residue of a filling material from the filling mandrel in a machine for the manufacture, filling and closure of containers wherein filling material is inserted into the container by means of the filling mandrel, said machine comprising blow mold means shaped to form said container including separable mold parts, said method comprising the steps of extruding plastic material from an extrusion nozzle, clamping said mold parts about said extruded plastic material with said plastic material thereby extending within said blow mold means shaped to form the container, said blow mold means including a filling section and means defining a constriction formed in said blow mold means within a region generally above said filling section and adjacent thereto, locating within said plastic material within said blow mold means a filling mandrel having a outer diametral dimension smaller than said constriction to form therebetween an annular gap having a thickness approximately equivalent to the wall thickness of a segment of said container, forming said container in said blow mold means, filling said container with filling material through said filling mandrel with said mandrel being located below the level of the filling material during at least a substantial portion of the filling operation, moving said blow mold means relative to said filling mandrel to withdraw the filling mandrel from the blow means while said blow mold means is closed to separate the mandrel from said container while simultaneously stripping residue of the filling material adhering to the outer surface of the filling mandrel as the outer surface of the mandrel contacts a portion of the molded container in the constriction while passing the mandrel through the constriction by the relative movement of the mandrel from the blow mold means during separation of the mandrel from the container.

4,056,915

COMPENSATING STORE DEVICE IN SYSTEMS FOR DIRECTLY FEEDING CIGARETTES FROM CIGARETTE MANUFACTURING MACHINE OR MACHINES TO THE HOPPER OF THE CIGARETTE PACKETING MACHINE

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed Jan. 22, 1976, Ser. No. 651,332
Claims priority, application Italy, Jan. 29, 1975, 3323/75
Int. Cl.[2] B65B *57/14*
U.S. Cl. 53—59 R 10 Claims



1. Apparatus for compensating unbalances in operations of machines for producing and packeting cigarettes, comprising;

a compensating store cylinder having means for continously rotating it about a vertical axis and having vertically and radially extending cigarette-storing compartments distributed about the cylinder's circumference, each compartment having a generally open top and a generally open bottom and being dimensioned to permit horizontally disposed cigarettes in a cigarette pile one cigarette thick to be disposed in the compartment and slidingly to be moved downwardly along the same;

cigarette support means selectively actuatable for enabling such a pile to be disposed in each compartment and slidingly to be moved downwardly along the same;

a conveyor system including a cigarette-feeding conveyor, for feeding a stream of individual cigarettes to a fixed location at the top of the cylinder from a cigarette-producing machine for discharge into the top of one of the compartments during a first type of unbalance between operations of the producing machine and of a cigarette packet-

ing machine, and a cigarette-withdrawing conveyor for withdrawing a stream of individual cigarettes from the bottom of the compartment to a fixed location at the bottom of the cylinder and further to the packeting machine during a second type of unbalance between such operations;

means for controlling the conveyor system and for actuating the cigarette support means in response to either type of unbalance; and

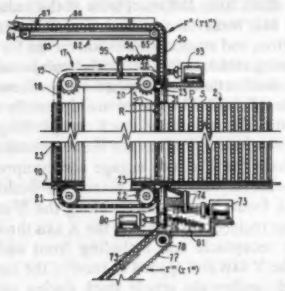
transfer channel means for selectively delivering cigarettes from the feeding conveyor into successive ones of the compartments and for discharging cigarettes therefrom to the withdrawing conveyor, comprising two transfer channels, each tiltably mounted at one of said fixed locations, each channel having a cigarette transfer section disposed to be moved with and relative to the cylinder during the cylinder's rotation and to provide an open path for cigarettes smoothly sliding between the section and one of the compartments, for a predetermined time, and thereafter to establish similar communication between the section and a next following one of the compartments, and means for gradually tilting the channels to effect the moving of their respective transfer sections with the cylinder, and thereby to insure the smooth sliding of the cigarettes when the cigarette support means are actuated.

4,056,916

COMPENSATING STORE DEVICE IN SYSTEMS FOR DIRECTLY FEEDING CIGARETTES FROM CIGARETTE MANUFACTURING MACHINE OR MACHINES TO THE HOPPER OF THE CIGARETTE PACKETING MACHINE

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed Jan. 22, 1976, Ser. No. 651,334
Claims priority, application Italy, Jan. 29, 1975, 3324/75
Int. Cl.² B65B *57/14*
U.S. Cl. 53—59 R **10 Claims**



1. Apparatus for compensating operating unbalances of machines for producing and packeting cigarettes, comprising:

a compensating storage cylinder having means for intermittently rotating it about a vertical axis to provide a regular succession of stops of the cylinder, the cylinder having vertically and radially extending cigarette-storing compartments distributed about the cylinder's circumference, each compartment having a generally open top and a generally open bottom and being dimensioned to permit horizontally disposed cigarettes in a cigarette pile one cigarette thick to perform sliding movements downwardly into, along and from the compartment;

cigarette support means for selectively enabling such movements of the cigarettes in synchronism with the stops of the cylinder;

a conveyor system, including, a cigarette-feeding conveyor movable for feeding a stream of individual cigarettes from a cigarette-producing machine to a first fixed location adjacent the top of the cylinder upon a first type of operating unbalance between the producing machine and a cigarette packeting machine, and a cigarette-withdrawing conveyor for withdrawing a stream of individual cigarettes from a second fixed location at the bottom of the cylinder and feeding it to the packeting machine on a second type of operating unbalance between the machines, the second fixed location being vertically below the first fixed location;

means for selectively actuating the conveyors while also actuating the cigarette support means in response to either type of unbalance and during the same;

a transfer system interposed between each conveyor and the cylinder and comprising a pair of transfer channel units, one at each fixed location, each transfer channel unit comprising a vertical fixed channel and a channel movable between a vertical and an inclined position, the channels of each unit being disposed in sequence, one with the other, between the respective conveyor and a point at an end of each successive cylinder compartment disposed between the fixed locations during each stop; and

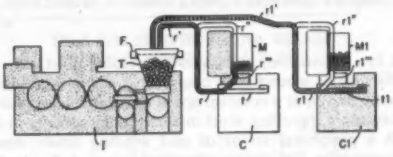
transfer control means for, sequentially, holding the movable channels of both transfer channel units in their inclined position during the rotating of the cylinder to prevent said sliding movements, and holding the movable channel of one transfer unit in its vertical position during a stop of the cylinder, to insure the sliding movements of the cigarettes into the compartments during the first type of unbalance and from the compartments during the second type of unbalance.

4,056,917

SYSTEM FOR TRANSFERRING AND STORING CIGARETTES

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed Jan. 22, 1976, Ser. No. 651,335
Claims priority, application Italy, Jan. 29, 1975, 3322/75
Int. Cl.² B65B *57/14*
U.S. Cl. 53—59 R **7 Claims**



1. A plant having at least two cigarette manufacturing machines, one packaging machine, and a storage unit for compensating operating unbalances of the manufacturing and packaging machines, the storage unit comprising;

a compensating storage cylinder having means for rotating it about a vertical axis and having vertically and radially extending cigarette-storing compartments distributed about the cylinder's circumference, each compartment having a top and a bottom and being dimensioned to permit cigarettes to be horizontally disposed in a cigarette pile one cigarette thick in the compartment between the top and the bottom;

cigarette support means capable of actuation for enabling cigarettes in such a pile to be slidingly moved downwardly along the compartment;

a conveyor system, including (a) a cigarette-feeding conveyor for feeding a stream of individual cigarettes from a cigarette-manufacturing machine to a fixed location at the top of the cylinder for discharge into the top of one of the compartments during a first type of operating unbalance between the manufacturing machine and a cigarette-packaging machine, and (b) a cigarette-withdrawing conveyor for withdrawing a stream of individual cigarettes from the bottom of one of the compartments to a fixed location at

the bottom of the cylinder and further to the packaging machine during a second type of operating unbalance between the machines;

means for selective actuation, in response to either type of unbalance, of the respective conveyor and of the cigarette support means; and

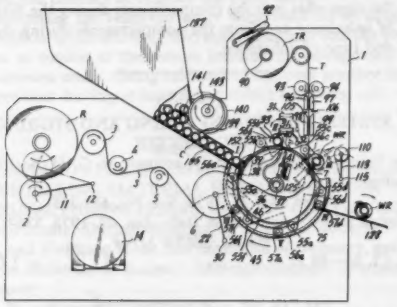
transfer channel means for, selectively, delivering cigarettes from the feeding conveyor into the top of one of the compartments, and discharging cigarettes from the bottom of one of the compartments to the withdrawing conveyor, comprising two transfer channels, each tiltably mounted at one of said fixed locations and each having means for tilting it to provide a path for cigarettes smoothly sliding between the pile and the respective one of the conveyors, and to close said path.

4,056,918

WINDING MACHINE

Yukimichi Matsumoto, Hirakata, Japan, assignor to Kabushiki Kaisha Fuji Tekkosho, Japan

Filed Oct. 8, 1976, Ser. No. 730,996
Claims priority, application Japan, Oct. 11, 1975, 50-122590
Int. Cl.² B65B *63/04*
U.S. Cl. 53—118 **7 Claims**



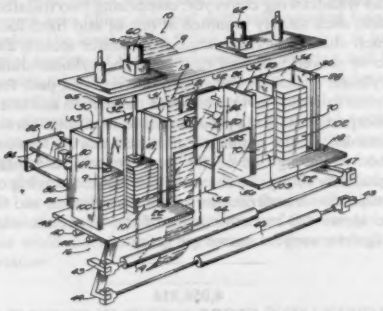
1. In a roll-winding apparatus for winding sheet material into a plurality of wound rolls comprising; a winding drum rotationally driven at a constant speed of rotation; feed means for advancing a travelling sheet material longitudinally in contact with a peripheral sector of said winding drum; means for automatically presenting elongated cores individually and successively to a winding station at said sector and in contact with said travelling sheet material and pressed thereagainst and against said drum in position parallel with said drum for each being rotationally driven about a corresponding longitudinal axis thereof; said means for automatically presenting elongated cores comprising means biasing the individual cores in a direction toward the periphery of said winding drum; means for winding a leading end section of said sheet material on each successive rotating core at said winding station and each with a desired length of sheet material wound thereon as a wound roll; said means for presenting said elongated cores to said winding drum comprising means to transfer successively would rolls from said winding station to a discharge station on said drum downstream of the winding station while maintaining sheet material wound on each of said wound rolls bearing against said winding drum for rotating by said drum about said corresponding longitudinal axis of each corresponding core; said means to transfer comprising means driven intermittently angularly equal increments about the longitudinal axis of said winding drum; means to automatically sever the sheet material during each transfer of a wound roll from said winding station; and said means for winding said leading section comprising means for automatically winding on each said successive core a leading end section of each next successive length of sheet material after severing of each length of sheet material from said sheet material upon winding thereof on a corresponding core.

4,056,919

DIAPER PACKER

John L. Hirsch, Sheboygan Falls, Wis., assignor to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Oct. 27, 1976, Ser. No. 736,041
Int. Cl.² B65B *63/02*
U.S. Cl. 53—124 D **5 Claims**



1. Apparatus for packing compressible articles in cartons comprising means for forming a stack of the articles oriented along a Z axis at a stack forming station, a carriage having a stack carrying receptacle having spaced walls for confining a stack agains lateral shifting during carriage movement, means for moving the stack onto said carriage and within said receptacle, means for moving the carriage along a Y axis transverse to the Z axis and between a stack receiving position at the stack forming station and a stack unloading station, pusher means for pushing the stack from the receptacle at the unloading station along an X axis transverse to said Z and Y axes and into a shipping carton, and stack compression means for compressing and maintaining said article stack under compression along the Z axis while said articles are pushed in the direction of the X axis and wherein said receptacles are upwardly open on two sides along the X axis and said stack compressing means comprises a pressure plate, and means for reciprocating the pressure plate along the Z axis to engage and compress the article stack, and wherein said pusher means for pushing the compressed stack from the receptacles along the X axis comprises a pusher plate reciprocatable along the X axis through the open sides of the receptacle and including front and rear panels parallel to the Y axis and spaced to receive the carriages therebetween and confine the article stack during carriage movement along the Y axis.

4,056,920

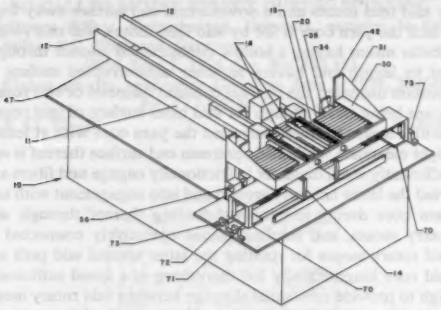
LOADING APPARATUS

Walter A. Shields, 181-41 Henley Road, Jamaica, N.Y. 11432

Filed Nov. 24, 1976, Ser. No. 744,479
Int. Cl.² B65B *5/08, 5/10, 35/30*
U.S. Cl. 53—142 **9 Claims**

1. Apparatus for loading a plurality of articles into a receptacle having parallel rows of openings each of which is adapted to receive a respective one of the articles, comprising a loading station including means for guiding and supporting said articles in a row parallel to and spaced above and laterally of a row of said openings to be filled with the row of articles, said guiding and supporting means including movable guide means for engaging the row of articles laterally, means for moving said movable guide means between a position in which said movable guide means laterally engages the row of articles and a position in which the movable guide means is disengaged from

the row of articles, carrying means for the row of articles, means for moving the carrying means into engagement with the articles thereby to provide support for and carry the articles when the movable guide means is disengaged from the articles and for then moving the carrying means with the row of articles carried thereby laterally toward and into vertical alignment with the openings of the row of said openings to be filled with the row of articles, means for increasing the spacing between the carrying means to a spacing corresponding to the



spacing between the openings of the row to be filled as the articles are laterally carried by the carrying means into vertical alignment with the openings of the row to be filled and means for moving the carrying means vertically downwardly thereby to lower the articles partly into the openings, said means for moving the carrying means laterally including means for then moving the carrying means laterally in reverse of the former lateral movement thereby to disengage the carrying means from the articles partly received in the openings to permit the articles to descend further into the openings.

4,056,921

ASEPTIC PACKING UNIT AND A SERVICE UNIT FOR PROVIDING THE PACKING UNIT WITH STERILE UTILITIES

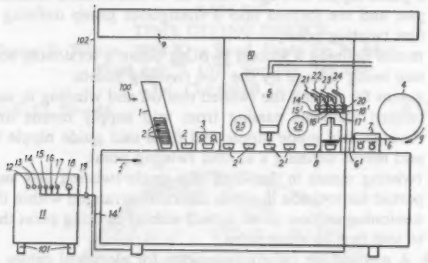
André Ferdinand Louis Gilliand, Rorschacherberg, and Christian Looser, Lutzenberg, both of Switzerland, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Nov. 3, 1975, Ser. No. 628,322

Claims priority, application Switzerland, Nov. 5, 1974, 014799/74

Int. Cl.² B08B *13/00*; B65B *17/00, 55/04, 55/12*

U.S. Cl. 53—167 **3 Claims**



1. The combination of an aseptic packing unit and a service unit;

a. the aseptic packing unit comprising

i. means for providing a sterile workspace,

ii. sterile means within said workspace for filling previously sterilized containers with previously sterilized filling material and closing said containers, when filled, with previously sterilized lids,

iii. means for providing a descending curtain of sterile air surrounding said sterile workspace, said curtain of air providing a barrier preventing contamination from outside said sterile workspace,

iv. means operable within said sterile workspace for manipulation of said sterilized containers, lids for closing said containers, said sterilized filling material and said filled and closed containers,

v. a plurality of tools comprising supply guns operable by said manipulating means to provide utilities including sterile water and sterile air within said sterile workspace without loss of sterility within said workspace,

vi. a plurality of first detachable couplings on the exterior of said unit outside said curtain of air, and

vii. supply lines for connecting said tools to said first detachable couplings, said supply lines including means for prevention of contamination of said tools when said first detachable couplings are detached and open to non-sterile conditions;

b. the service unit being a mobile unit exterior to and independent from said aseptic packing unit and said sterile workspace, said service unit comprising

i. a plurality of inlets, for utilities including water and air,

ii. means for sterilizing said utilities,

iii. a plurality of outlets including second detachable couplings adapted to connect to corresponding ones of said first detachable couplings on said aseptic packing unit thereby supplying said tools with said utilities without loss of sterility, and

iv. a suction pump within said service unit to exhaust a waste line from said sterile workspace;

c. said first and second detachable couplings being co-acting sets of quick-acting plug-in, non-return couplings.

4,056,922

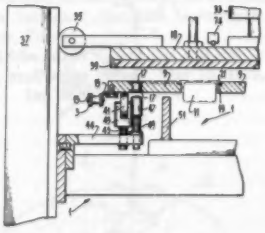
SEALING MACHINES

Hank John Schilte, 9 Burton Court, Bayswater, Victoria, Australia

Filed Feb. 23, 1976, Ser. No. 660,674

Int. Cl.² B65B *51/14, 7/28*

U.S. Cl. 53—373 **7 Claims**



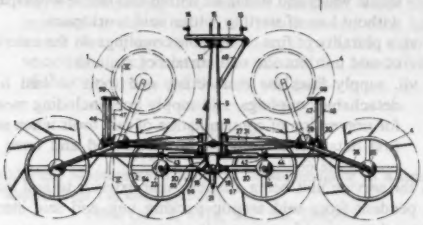
1. Plate means for use in heat sealing backings to covers to package articles therein, said plate means having at least one aperture therethrough into which a cover can be placed from a top face of said plate means, electric heating element means surrounding the periphery of said at least one aperture and electric contact means imbedded in said plate means for permitting electric heating energy to be passed to said electric heating element means, part of said electric contact means being on the bottom face of the plate means remote from the face of intended direction of insertion of a cover into said at least one aperture, locating means for locating backings over said aperture, and a single fastening means on each side of said plate means for permitting releasable attachment to a conveyor chain means.

4,056,923

AGRICULTURAL IMPLEMENT

Petrus Wilhelmus Zweegers, Nieuwendijk 46, Geldrop, Netherlands

Filed Jan. 23, 1976, Ser. No. 651,975
Claims priority, application Netherlands, Feb. 4, 1975, 7501290
Int. Cl.² A01D 79/00, 77/00
U.S. Cl. 56—366 24 Claims



1. Agricultural implement having a direction of travel and comprising means defining a frame extending transversely to the direction of travel, four adjacent positively driven tine-carrying rake wheels rotatable about substantially vertical axes on said frame means and disposed to define two inner and two outer wheels, means including the two inner wheels for defining a unit so mounted on said frame means as to be reversible such that either of said two inner wheels can occupy the position occupied by the other of said two inner wheels.

4,056,924

YARN-TWISTING METHOD AND APPARATUS

John Umiastowski, 127 Sunnyside Place, Dollard des Ormeaux, Quebec, Canada

Filed Mar. 26, 1975, Ser. No. 562,113
Claims priority, application Canada, Mar. 29, 1974, 196403
Int. Cl.² D02G 3/36, 3/34, 3/40
U.S. Cl. 57—5 12 Claims

1. In a yarn manufacturing method, the steps of false twisting a yarn core which has a plurality of fibers projecting laterally from the surface of said core for first introducing a twist in a given direction into the yarn core and for then releasing the yarn core so that it tends to twist upon itself in a direction opposite to said given direction, and, while said twist in said given direction is introduced into the yarn core, winding said fibers projecting laterally from said core at least partly into engagement with the surface thereof in a direction opposite to said given direction, so that the thus wound fibers form surface fibers at the surface of said core maintaining said twist in said given direction therein, tensioning said fibers while they are wound around said core, and false-twisting said core solely by the tensioning of the fibers while they are wound around said core.

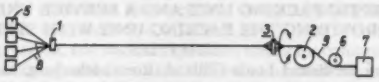
6. In a yarn-manufacturing apparatus, feed means for feeding longitudinally along a predetermined path an elongated yarn core from the exterior surface of which a plurality of fibers project laterally, rotary tubular means surrounding said path for rotating about the latter and about a yarn core fed longitudinally therealong by said feed means, said rotary means having an upstream end surface toward which the yarn core is fed by said feed means and a downstream end surface away from which the yarn core is fed by said feed means, and said rotary tubular means having a hollow unobstructed interior throughout its length and having an inner uninterrupted surface of constant diameter, the internal constant diameter of said rotary means being small enough for said inner surface of said rotary tubular means to freely surround the yarn core with at least a slight clearance while said upstream end surface thereof is of a sufficiently small diameter to frictionally engage said fibers and wind the latter helically around and into engagement with said yarn core during longitudinal feeding thereof through said rotary means, and rotating means operatively connected to said rotary means for rotating the latter around said path and said core longitudinally fed therealong at a speed sufficiently high to provide substantial slippage between said rotary means and said core, while the latter is false twisted solely as a result of the action of said rotary means on said fibers.

4,056,925

METHOD AND APPARATUS FOR THE SZ-TWISTING OF ELECTRICAL CABLES

Dieter Vogelsberg, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 12, 1975, Ser. No. 630,947
Claims priority, application Germany, Nov. 15, 1974, 2454777
Int. Cl.² D01H 7/90; H01B 13/02
U.S. Cl. 57—34 AT 17 Claims



1. Apparatus for twisting elements for an electrical cable into a twisted unit having a twist direction which alternates from section to section comprising:

a. supply means for twisted elements;
b. a guide nipple through which all of said twisted elements pass and are formed into a contiguous group defining a first twisting point;
c. means defining a second twisting point, a torsioning section being defined by the two twisting points;
d. means for pulling the twisted unit off and winding it; said twisted elements passing from said supply means first through said guide nipple and from said guide nipple to said means defining a second twisting point;
e. twisting means in the form of a single twisting disk supported for rotation in either direction arranged within the torsioning section closer to said second twisting point that to said first twisting point.

14. A method for twisting elements for electrical cables to form a twisted unit having a twist direction which alternates from section to section comprising the steps of:

a. tensioning the twisting elements between a first and second twisting point with said twisting elements contiguous to each other at both said first and second twisting points;
b. disposing a twisting device comprising a single twisting disc near said second twisting point;
c. running said twisting elements through the section defined between said first and second twisting points from said first to said second twisting point in a stretched condition;

d. rotating said twisting disc with a direction of rotation which alternates; and

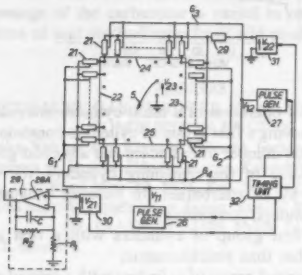
e. changing the direction of rotation of said twisting disc only after at least three complete revolutions in one direction.

4,056,926

METHOD AND APPARATUS FOR DETECTING SO-CALLED MOIRE EFFECT DURING SPINNING

Wolfgang Stüber, Dettenhausen, Germany, assignor to Otto Stüber KG, Bissingen, Germany

Filed June 7, 1976, Ser. No. 693,151
Claims priority, application Germany, June 7, 1975, 2525461
Int. Cl.[2] D01H *13/22*
U.S. Cl. 57—81 8 Claims



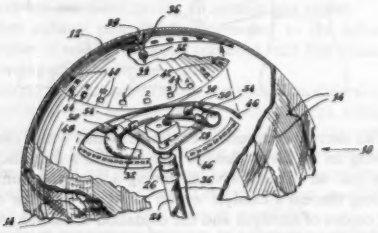
2. In a device for detecting defective portions of yarn, during spinning of yarn and the like by a spinning machine, of the type having a thread monitoring unit for detecting relatively long variations in the thickness of the yarn and including a pulser connected to a time switch, and, responsive to detection of such relatively long variations in the yarn thickness, providing an output signal for control of the spinning machine: a moire monitoring device, operable to detect the number of defective portions of the yarn, occurring at periodic spacings within a predetermined time period, connected between said pulser and said time switch and operable to activate said time switch to provide said output signal responsive to the number of detected defective portions of the yarn occurring within such predetermined time period exceeding a desired value.

4,056,927

TIME GIVING DEVICE

James R. Wilson, 2050 Kiva Road, Santa Fe, N. Mex.

Filed Apr. 7, 1977, Ser. No. 785,350
Int. Cl.[2] G04B *19/22*
U.S. Cl. 58—44 4 Claims



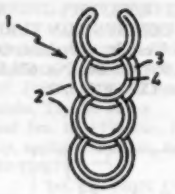
1. Apparatus for determining the time on any geographical area of the earth which comprises a transparent globe segmented into time zones, and an hour plate within said globe having numbers representing hours of the days, perforations on said plate each associated with one of said hour numbers, means within said globe positioned below said perforations for determining minute time, means for rotating said plate 360° every 24 hours and means for illuminating the interior of said globe.

4,056,928

DETACHABLE LINK-CHAIN

Robert de Vries, 2 Valeriusstraat, The Hague, Netherlands

Filed Apr. 29, 1976, Ser. No. 681,508
Claims priority, application Netherlands, Sept. 15, 1975, 7510815
Int. Cl.[2] F16G *15/12*
U.S. Cl. 59—83 1 Claim



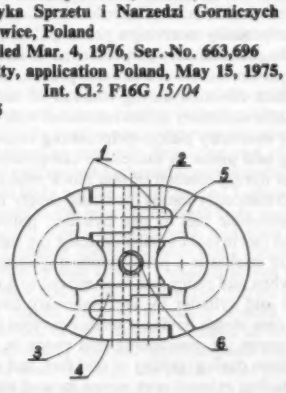
1. A link-chain formed by assembling links in series, each of said links comprising a smaller and larger pair of connected substantially annular loops in substantially parallel superimposed relationship one to another, the outer diameter of said smaller loop being so dimensioned with respect to the inner diameter of said larger loop that the smaller loop of one link is insertable in a tight fit through the larger loop of the next adjacent link in said chain and wherein the distance apart of the two superimposed loops of each pair is sufficiently smaller than the diameter of the material of the rod forming said loop to permit the snapping of a subsequent link in or out.

4,056,929

CHAIN QUICK-CONNECTING LINK

Eryk Chrobak, Siemianowice Slaskie; Benedykt Natkaniec, Katowice; Zenon Wasyleczko, Katowice; Antoni Stawinski, Katowice, and Andrzej Roczek, Zabrze, all of Poland, assignors to Fabryka Sprzetu i Narzedzi Gorniczych im. Gen. Karola, Katowice, Poland

Filed Mar. 4, 1976, Ser. No. 663,696
Claims priority, application Poland, May 15, 1975, 180422
Int. Cl.[2] F16G *15/04*
U.S. Cl. 59—85 2 Claims



1. A quick-coupling link for driving chains comprising: two identical half-links, each identical half-link having at its one end a forwardly extending projection having a longitudinal axis, said projection having a stepped portion along said longitudinal axis, the other end of each link having a stepped-shaped slot portion, said projection and said slot portion lying substan-

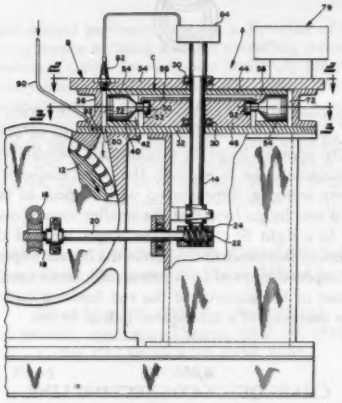
tially in the same plane as the remainder of said half-link; spacing insert means between said ends of said links; pin means passing through said projection and said slot portion for permanently interconnecting said two half-links, the two ends of each half-link having at least two cylindrical openings with axes lying substantially in said plane; an expanding sleeve in said spacing insert means for inhibiting removal of said pin means from said half-links, said pin means passing through said cylindrical openings.

4,056,930

INTERNAL COMBUSTION TURBINE

Henry B. Sherman, 935 West St., Cleveland, Ohio 44113

Filed Apr. 9, 1976, Ser. No. 675,576
Int. Cl.[2] F02G *3/00*
U.S. Cl. 60—39.78 **6 Claims**



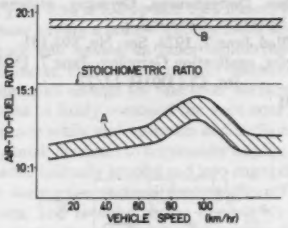
1. Apparatus comprising a cylinder block mounted for rotation about a block axis, means for rotating said cylinder block about said block axis, said cylinder block including at least one cylinder reciprocally receiving a piston and having a cylinder axis extending substantially perpendicular to said block axis so that said cylinder travels in a circular predetermined path in a predetermined direction during rotation of said block about said block axis, stationary means associated with said block and including a stationary piston-reciprotating cam means for reciprocating said piston in successive compression and expansion strokes during rotation of said block relative to said cam means, said stationary means including supply means for supplying combustible fuel to said cylinder, igniting means for igniting said fuel in said cylinder adjacent the end of one of said compression strokes at a predetermined ignition point in said path and when said piston has been moved to a predetermined position in said cylinder by said stationary cam means, said stationary cam means having a surface portion in engagement with said piston for maintaining said piston in said predetermined position during igniting of said fuel, and said stationary means including exhaust port means located closely adjacent said predetermined ignition point and spaced slightly therefrom in said predetermined direction so that a substantial volume of expanding gases in said cylinder expand outwardly therefrom through said exhaust port means rather than moving the piston toward the axis of block rotation, and a rotatable turbine wheel positioned for being rotatably driven by gases flowing through said exhaust port means.

4,056,931

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATION THEREOF

Yoshitaka Hata, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 16, 1975, Ser. No. 578,189
Claims priority, application Japan, May 21, 1974, 49-57717
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—274 **13 Claims**



1. A method of operation of a multi-cylinder internal combustion engine having a first group of cylinders consisting of at least half the total number of cylinders and a second group of cylinders consisting of the remaining cylinders, the engine being followed by an afterburner for burning exhaust gases from all the cylinders, comprising:

feeding said first group of cylinders with a first air-fuel mixture richer than stoichiometric;

feeding said second group of cylinders with a second air-fuel mixture leaner than stoichiometric; and

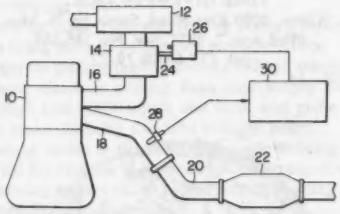
feeding said fist group of cylinders with an air-fuel mixture which is leaner than said first air-fuel mixture and richer than stoichiometric only when the engine is operated at medium engine speed range.

4,056,932

CONTROL SYSTEM FOR PROMOTING CATALYTIC REMOVAL OF NOXIOUS COMPONENTS FROM EXHAUST GAS OF INTERNAL COMBUSTION ENGINE

Koyo Nakamura, Yokosuka, and Hiroshi Sanbuichi, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Oct. 30, 1975, Ser. No. 627,334
Claims priority, application Japan, Nov. 1, 1974, 49-132670[U]; Nov. 12, 1974, 49-129583
Int. Cl.[2] F02D *33/00, 35/00*
U.S. Cl. 60—276 **32 Claims**



1. In an internal combustion engine provided with a carburetor having an air bleed passage opening into a fuel discharge passage and an exhaust system having a catalytic converter containing therein a catalyst which catalyzes both the reduction of oxides of nitrogen and the oxidation of carbon monoxide and hydrocarbons, a system for promoting the catalytic conversion reactions in the catalytic converter, comprising:

means for defining an auxiliary air admitting passage connected to the fuel discharge passage of the carburetor;

means for sensing the concentration of a particular compo-

nent of the exhaust gas in the exhaust system at a section upstream of the catalytic converter and for producing an electrical signal representing the sensed concentration, said concentration being in dependence on the air/fuel ratio of an air/fuel mixture fed to the engine;

a control circuit having means for continuously producing electrical pulses at a frequency between 5 and 100 Hz, the width of said pulses varying individually in dependence upon said air/fuel ratio such that said width increases when said air/fuel ratio indicated by said electrical signal is below a predetermined ratio which equals at least approximately to a stoichiometric air/fuel ratio and decreases when said air/fuel ratio is above said predetermined ratio; and

an electromagnetic valve receptive of said pulses and effective to allow admission of auxiliary air to said auxiliary air admitting passage only when each of said pulses is applied thereto, so that the fuel discharge rate to the induction passage of the carburetor is varied in response to deviations of said air/fuel ratio from said predetermined ratio.

4,056,933

EXHAUST GAS PURIFIER IN AN INTERNAL COMBUSTION ENGINE

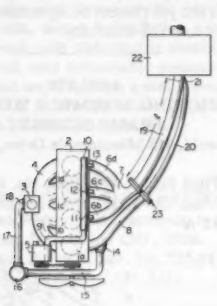
Hidetaka Nohira, and Kiyoshi Kobashi, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 19, 1976, Ser. No. 687,757

Claims priority, application Japan, Jan. 9, 1976, 51-1473

Int. Cl.[2] F02M *25/06*; F01N *3/10*

U.S. Cl. 60—278 **6 Claims**



1. An exhaust gas purifier in an internal combustion engine having a plurality of cylinders and an air intake system, comprising:

a first exhaust manifold connected to at least one of said cylinders, said first exhaust manifold having an exhaust gas outlet;

a second exhaust manifold connected to the remaining cylinders other than said at least one cylinder, said second exhaust manifold having an exhaust gas outlet;

a first exhaust pipe fluidly connected to the exhaust gas outlet of said first exhaust manifold, said first exhaust pipe having an exhaust gas outlet;

a second exhaust pipe fluidly connected to the exhaust gas outlet of said second exhaust manifold, the exhaust gas outlet of said first exhaust pipe being fluidly connected with said second exhaust pipe at a position remote from the exhaust gas outlet of said second exhaust manifold so that the exhaust gas in said second exhaust manifold does not enter into said first exhaust manifold;

an exhaust gas passage between said remaining cylinders and the exhaust gas outlet of said second exhaust manifold;

means for feeding secondary air into the exhaust gas passage between said remaining cylinders and the exhaust gas outlet of said second exhaust manifold;

an exhaust gas passage between said one cylinder and the exhaust gas outlet of said first exhaust manifold;

a recirculated exhaust gas inlet disposed in the exhaust gas passage between said one cylinder and the exhaust gas outlet of said first exhaust manifold;

a recirculated exhaust gas outlet disposed in the air intake system;

a recirculated exhaust gas conduit fluidly connecting said recirculated exhaust gas inlet with said recirculated exhaust gas outlet for delivering recirculated exhaust gas containing no secondary air therein from said recirculated exhaust gas inlet to the recirculated exhaust gas outlet; and

means for controlling the flow rate of the recirculated exhaust gas in the recirculated exhaust gas conduit.

4,056,934

AFTER-BURNING PREVENTIVE AND FLAME-OUT APPARATUS

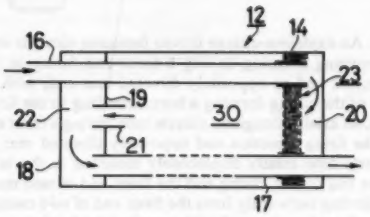
Shinichiro Mizusawa, Okazaki; Chiharu Tamura, Toyota; Norihiko Nakamura, Mishima, and Hiromichi Yanagihara, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 15, 1976, Ser. No. 649,527

Claims priority, application Japan, Sept. 27, 1975, 50-116647; Oct. 15, 1975, 50-124079

Int. Cl.[2] F01N *3/06*

U.S. Cl. 60—311 **8 Claims**



1. In a muffler for an internal combustion engine, including an after-burning preventive and flame-out apparatus provided therein, so that flame which takes place in the course of running of a gas mixture through an exhaust system from the engine to the muffler may be extinguished by means of an improved flame-out apparatus comprising:

a first L-shaped screen member including a longitudinally extending body portion and a transversely oriented flange portion extending inwardly from one end of said body portion, the outer face of said body portion being welded to the inner face of the outer body of the muffler;

a second L-shaped screen member including a longitudinally extending body portion and a transversely oriented flange portion extending inwardly from one end of said body portion of said second L-shaped screen member, the outer face of said body portion of said second L-shaped member being welded to the inner face of said body portion of said first L-shaped screen member with said body portion of said first L-shaped screen member being longer than said body portion of said second L-shaped screen member in the axial direction so that said flanged portion of said first L-shaped screen member is axially spaced from said flanged portion of said second L-shaped screen member;

a pair of transversely oriented partition plates each having a plurality of small openings, the axially outer surface of one of said partition plates being welded to the axially inner surface of said flange portion of said first L-shaped screen member while the axially outer surface of said other partition plate being welded to the axially outer surface of said flange portion of said second L-shaped screen member whereby an axially extending space is defined between said pair of partition plates; and

flame extinguishing means filling said axially extending

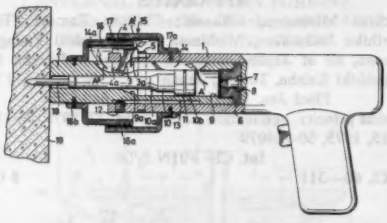
space between said pair of partition plates and the inner surface of said body portion of said first L-shaped screen member for extinguishing the flame which takes place in the gas exhaust system.

4,056,935

DAMPING CHAMBER FOR AN EXPLOSIVE CHARGE-DRIVEN FASTENING ELEMENT SETTING GUN

Horst-Detlef Gassmann, Schaan, Liechtenstein, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 9, 1975, Ser. No. 639,048
Claims priority, application Germany, Dec. 20, 1974, 7442603[U]
Int. Cl.² F01B 29/08; B25C 1/12
U.S. Cl. 60—632 9 Claims



1. An explosive charge driven fastening element setting gun comprising a casing having a front end facing in the firing direction and an oppositely directed rear end, with the front end of the casing forming a bore extending in the firing direction, an axially elongated muzzle tube having a front end facing in the firing direction and oppositely directed rear end, said muzzle tube axially displaceably mounted in the bore in the front end of said casing and the front end of said muzzle tube projecting outwardly from the front end of said casing, at least one of said casing and said muzzle tube having a gas outlet orifice opening laterally therefrom, wherein the improvement comprises a damping housing mounted on said casing and on said muzzle tube and forming a closed chamber covering said gas outlet orifice for receiving explosive gases flowing therefrom and said closed chamber being openable for releasing the explosive gases collected therein.

4,056,936

BENTHIC SEMI-BARRIER TO CONTROL THE GROWTH OF WEEDS IN AQUATIC ENVIRONMENTS

J. Richard Mayer, 13 University Park, Fredonia, N.Y. 14063

Continuation-in-part of Ser. No. 518,547, Oct. 29, 1974, abandoned. This application Apr. 13, 1976, Ser. No. 676,965
Int. Cl.² E02B 3/00
U.S. Cl. 61—1 R 2 Claims

1. An ecologically harmless method of limiting weed growth in selected areas of the bottom of a body of water comprising the steps of:

placing a noncorrosive foraminous screen, having a plurality of generally uniform apertures, on an area to be treated upon existant plant life and in a co-planar relationship with the bottom of the body of water;

maintaining said noncorrosive foraminous screen in close proximity and co-planar relationship with the bottom of the body of water;

inhibiting plant growth in the area beneath said noncorrosive foraminous screen by,

shielding said area from a substantial degree of the sun's rays with said noncorrosive foraminous screen; and

limiting plant size in an area beneath and through said noncorrosive foraminous screen by,

limiting the size of plant stems which extend through the foraminous screen to the size of the apertures in said noncorrosive foraminous screen.

4,056,937

METHOD OF CONSOLIDATING SOILS

Manao Suzuki, Tokyo, Japan, assignor to Kyokado Engineering Co. Ltd., Tokyo, Japan

Filed Jan. 8, 1976, Ser. No. 647,596
Int. Cl.² E02D 3/14
U.S. Cl. 61—36 B 14 Claims

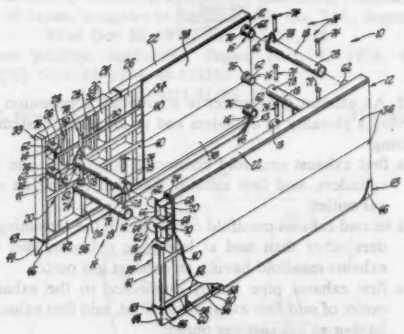
1. In a method of solidifying a soil or making soil water-tight by injecting a hardener thereinto, in which a mixture of water glass and acidic reacting agent is employed as said hardener, and said solution is blended so that the pH value thereof is within a range of from weak acidity of about fine to weak alkalinity of about 9, thereby to reduce the pollution of soil or subterranean water, characterized in that a liquid A which is a solution of one or two materials selected from the group consisting of a gel control agent and clay, and a liquid B which is a mixture of water glass and acidic reacting agent are employed as said hardener, and said liquids A and B are joined together and are injected into said soil, said liquid B being blended so that the pH thereof being maintained within a range of from acidity to weak alkalinity.

4,056,938

TRENCH SHORING ASSEMBLY WITH RIGID MAIN FRAME SUPPORT

James L. Griswold, 513 Morningside Drive, Battle Creek, Mich. 49015

Filed Feb. 9, 1976, Ser. No. 656,127
Int. Cl.² E21D 5/00; E04C 2/32
U.S. Cl. 61—41 A 8 Claims



1. A trench shoring assembly of the type including a pair of spaced wall means interconnected by connecting means, the connecting means including spreader devices, said assembly comprising: wall means including interconnected structural members defining a main frame, plate means disposed over at least a portion of said frame and secured to at least some of said structural members, said structural members being connected together to define spaces therebetween and having a depth along each side extending outwardly of said plate means, and support means rigidly secured to at least one of said structural members of said main frame along the side and the depth thereof for connection to the spreader devices for transferring

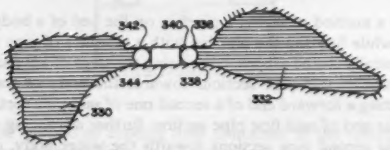
forces from the spreader devices directly to said main frame, said support means including collar means and backing plate means, said collar means adapted to be connected to the spreader devices and said backing plate means being rigidly secured along the side of said one of said structural members whereby a force applied to said collar means is transferred to said main frame.

4,056,939

INFLATABLE ENVELOPE SYSTEMS FOR USE IN EXCAVATIONS

Alberto M. Alvarez-Calderon F., 512 E. Central St., Santa Maria, Calif. 93454

Division of Ser. No. 356,591, May 2, 1973, Pat. No. 3,937,025.
This application Jan. 8, 1976, Ser. No. 647,346
Int. Cl.² E21F 15/00
U.S. Cl. 61—35 7 Claims



1. Apparatus for forming a channel through a solidifiable substance backfilling an excavation chamber, said chamber having opposed walls portions of which are approximately parallel and uneven, an elongate tubular envelope, elongate deformable means disposed between the envelope and the adjacent opposed walls, means for inflating said envelope to thereby partially crush said deformable means between the envelope and the wall, said deformable means conforming to the unevenness of said walls to form a seal between said envelope and at least one of said walls which opposes the flow of said solidifiable substances across said seal.

4,056,940

TRENCH BOX HEIGHT ADAPTOR

Walter A. Fisher, Coldwater, Mich., assignor to Griswold Machine & Engineering, Inc., Union City, Mich.

Filed Oct. 26, 1976, Ser. No. 735,011
Int. Cl.² E21D 5/00, 5/12
U.S. Cl. 61—41 A 20 Claims

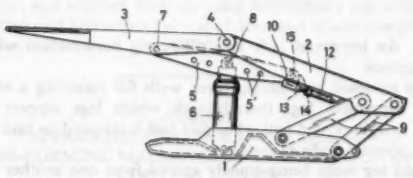
1. A trench shoring assembly comprising; first and second spaced wall means having upper surfaces, third and fourth spaced wall means stacked vertically upon said upper surfaces of said first and second wall means, said third wall means being stacked upon said first wall means to define a first substantially continuously extending vertical wall and said fourth wall means being stacked upon said second wall means to define a second substantially continuously extending vertical wall, first spreader means interconnecting first ends of said wall means, and second spreader means interconnecting all of said stacked wall means at the second ends thereof and extending across the space therebetween only above said upper surfaces for providing unobstructed space between said spaced wall means therebelow, said second spreader means including first connector means extending vertically for interconnecting said first and third wall means and second connector means extending vertically for interconnecting said second and fourth wall means, a first plurality of vertically aligned support means interconnecting said first wall means and said first connector means, a second plurality of vertically aligned support means interconnecting said third walls means and said first connector means, a third plurality of vertically aligned support means interconnecting said second wall means and said second connector means, a fourth plurality of vertically aligned support means interconnecting said fourth wall means and said second connector means, said second spreader means including tie bar means extending horizontally above said upper surfaces and interconnecting said first and second connector means.

4,056,941

MINE ROOF SUPPORT FOR AN UNDERGROUND MINE GALLERY

Willy Watermann, Dortmund-Lanstrop, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed Jan. 10, 1977, Ser. No. 758,303
Claims priority, application Germany, Jan. 15, 1976, 2601341
Int. Cl.² E21D 15/44
U.S. Cl. 61—45 D 10 Claims



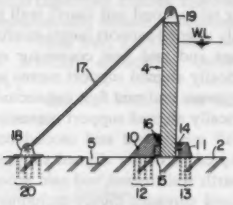
1. A mine roof support for an underground mine gallery comprising a sole plate adapted to rest on the floor of the mine gallery; a front shield adapted to engage the roof of the mine gallery and having a front end directed toward the mine face; a rear shield having a front end pivotally connected to the other end of said front shield and projecting rearwardly from the latter; a rocker arm connected at opposite ends respectively to said front and said rear shield intermediate the ends of said shields; expandable and contractable prop means supporting said rocker arm on said sole plate; and arm means pivotally connected to the other end of said rear shield and said sole plate.

4,056,942

METHOD FOR MOVING BUILT STRUCTURES BY FLOTATION

Toshio Yoshida, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed May 6, 1976, Ser. No. 683,942
Claims priority, application Japan, May 13, 1975, 50-57064
Int. Cl.[2] E02B 1/00
U.S. Cl. 61—65 8 Claims



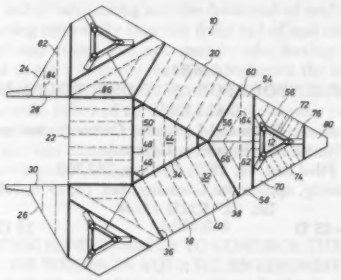
8. The method of claim 7, including packings embedded in each of the outer buttress blocks at a surface thereof facing the outer wall of the associated wall panel.

4,056,943

HULL CONSTRUCTION

D. Jarratt Tarrant, 12611 Rovensway Drive, Cypress, Tex. 77429

Filed Jan. 30, 1976, Ser. No. 653,767
Int. Cl.[2] E02D 21/00
U.S. Cl. 61—96 9 Claims



1. An improved jack up drilling rig construction which comprises

an enclosed hull having three wells for receiving a set of supportive legs therethrough which legs support the weight of said hull when said hull is elevated on said legs above a body of water;

said leg wells being equally spaced from one another and said Hull having first, second and third edge located sides extending between and near said leg wells;

symetrically constructed side compartments in said hull which are arranged adjacent to the edges of said hull which side compartments define by a common side a centrally located triangular compartment;

said side compartments having lengthwise members parallel to the edges of said hull for supporting the bending movements acting parallel to the edges of said hull; and

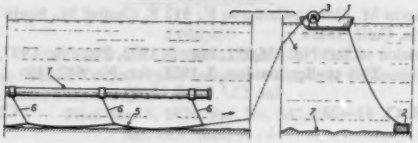
three corner located compartments incorporating said leg wells therein, said corner located compartments being positioned symetrically of said hull and each supporting a leg elevating means.

4,056,944

PROCESS AND DEVICE FOR LAYING SUBMARINE PIPELINES

Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to C. G. Doris (Compagnie Generale pour les Developpements Operationnels des Richesses Sous-marines), Paris, France

Filed May 13, 1976, Ser. No. 685,738
Claims priority, application France, Oct. 15, 1975, 75.15160
Int. Cl.[2] F16L 1/00
U.S. Cl. 61—107 17 Claims



1. In a method of laying a pipeline on the bed of a body of water while forming the pipeline with a plurality of pipe sections initially stored ashore, comprising the steps of advancing a first one of said pipe sections towards the body of water, connecting a forward end of a second one of said pipe sections to a rear end of said first pipe section, further advancing said first and second pipe sections towards the water body, connecting a forward end of a third one of said pipe sections to a rear end of said second pipe sections, and so on, each advancing step comprising applying a hauling force to a pipeline portion of substantial length to haul the same towards the body of water, the improvement comprising distributing the hauling force into a plurality of traction forces, and applying the traction forces to respective points spaced along said pipeline portion.

4,056,945

PROCESS AND DEVICE FOR LAYING SUBMARINE PIPELINES

Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris", Paris, France

Continuation-in-part of Ser. No. 685,738, May 13, 1976. This application Nov. 15, 1976, Ser. No. 741,622
Claims priority, application France, July 1, 1976, 76.20080
Int. Cl.[2] F16L 1/00
U.S. Cl. 61—107 6 Claims

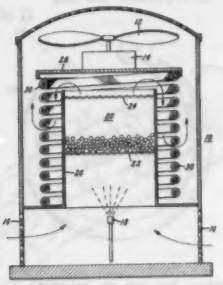
1. A method of laying a pipeline on the bed of a body of water while forming the pipeline with a plurality of pipe sections initially stored ashore, comprising the steps of advancing a first one of said pipe sections towards the body of water, connecting a forward end of a second one of said pipe sections to a rear end of said first pipe section, further advancing said first and second pipe sections towards the water body connecting a forward end of a third one of said pipe sections to a rear end of said second pipe sections, and so on, each advancing step comprising hauling a pipeline portion of substantial length towards the body of water, wherein each advancing step comprises applying a traction force to a forward end of said first pipe section, and applying a plurality of further traction forces to a plurality of points spaced along said pipeline portion.

4,056,946

LOW TEMPERATURE COOLER/CONDENSER

James A. Bond, West Chester; Spurgeon E. Eckard, and Arthur W. Schnacke, both of Cincinnati, all of Ohio, assignors to General Electric Company, Fairfield, Conn.

Filed Nov. 14, 1975, Ser. No. 632,109
Int. Cl.[2] F28D 5/00
U.S. Cl. 62—121 7 Claims



7. A method of cooling fluid contained in the tubing of a condenser comprising:

applying water to a bed of beads;

passing air first through said bed of beads and then over said tubing; and

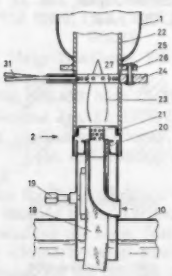
periodically terminating the application of water to said bed of beads long enough to dry said beads and fluidize said bed.

4,056,947

ABSORPTION REFRIGERATOR

Ernest W. Partsch, Dolderstrasse 63, Zurich, Switzerland (8032)

Filed Apr. 5, 1976, Ser. No. 673,744
Claims priority, application Switzerland, Apr. 15, 1975, 4806/75
Int. Cl.[2] F25B 15/00; F24H 3/02
U.S. Cl. 62—148 11 Claims



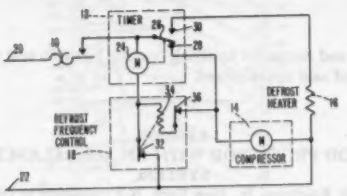
1. In an absorption refrigerator having a nonelectric boiler heating system, a box having a coolable interior and a side at which refrigerating equipment is mounted, said refrigerating equipment including a boiler and a heating burner located below said boiler for heating the same, electrically energizable blower means carried by said box, at least one centrally apertured ceramic disc formed with radial bores and disposed above said heating burner and substantially concentrically to said heating burner and said boiler so that heat originating in said burner is concentrated in the central aperture of said ceramic disc, and thermocouple means comprising a multiplicity of serially-connected thermocouple elements having respective hot junctions located within the central aperture of said ceramic disc, respective cold junctions located radially beyond the periphery of said ceramic disc and respective means extending through said radial bores for mutually connecting the respective hot and cold junctions to one another, said thermocouple means being electrically connected to said blower means for energizing the latter with electricity generated in said thermocouple means by the heat originating in said heating burner.

4,056,948

PRESETTABLE DEFROST TIMER

Carl J. Goodhouse, Litchfield, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 29, 1976, Ser. No. 700,984
Int. Cl.[2] F25D 21/08
U.S. Cl. 62—155 6 Claims



1. A defrost timing circuit comprising:

a compressure for refrigerating enclosures;

a defrost heater;

thermostat means responsive to the temperature in said refrigerated enclosures;

defrost timing means responsive to said thermostat means,

said defrost timing means including a timing motor means, and

a switch means operated by said timing motor means connected to said compressor and said defrost heater, said defrost timing means providing a first normal period of operation of said compressor and a second period of operation of said defrost heater after said first normal period of operation of said compressor;

means for selectively changing said first normal period of operation of said compressor,

said selectively changing means including a normally closed control switch in series with said timing motor means,

said selectively changing means further including a heat motor delay means connected and parallel with said compressor for opening said normally closed control switch after the selected duration of operation for said compressor, said selected duration being substantially less in time than said first normal period of operation of said compressor.

4,056,949

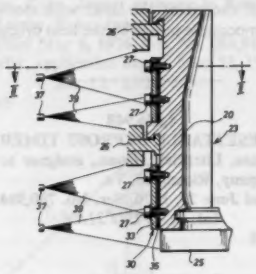
APPARATUS FOR COOLING TOOLS OF GLASS-FORMING MACHINES BY EVAPORATION OF A COOLING LIQUID

Karl Friedrich Hahn, Oberakirchen, Germany, assignor to Hermann Heye, Obernkirchen, Germany

Continuation of Ser. No. 461,385, April 6, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 675,806
Claims priority, application Germany, May 2, 1973, 2322091
Int. Cl.[2] F25D 17/02
U.S. Cl. 62—373 18 Claims

1. Apparatus for cooling tools of glass-forming machines by evaporation of a cooling liquid, comprising cover means substantially covering the tool surface to be cooled, said cover means having a surface in contact with said tool surface and being constructed and connected to said tool surface to vary the heat transfer between said surfaces to thus avoid film evap-

oration of a cooling liquid applied to that surface of said cover means which is opposite the surface in contact with said tool surface; and means for applying cooling liquid to said opposite surface of said cover means.

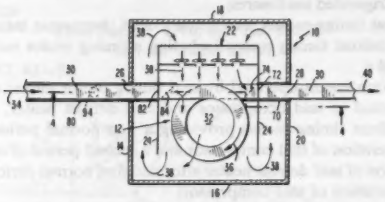


4,056,950

FOOD PROCESSOR WITH AN AIR BALANCING SYSTEM

Harold B. Kaufman, Jr., New York, N.Y., assignor to DCA Food Industries, Inc., New York, N.Y.

Filed May 25, 1976, Ser. No. 689,737
Int. Cl.[2] F25D *25/02*
U.S. Cl. 62—381 **14 Claims**



1. A system for blast freezing of food products comprising, a freezing chamber, food product entry and exit ports in said freezing chamber, food product conveying means extending through said entry port said freezing chamber and said exit port for conveying food products into through and out of said freezing chamber, means mounted in said freezing chamber for circulating refrigerated air over the food product as it is conveyed through said freezing chamber to freeze said food products, air balancing means coupled to at least one of said food entry or exit ports, said air balancing means including shroud means, means for coupling said shroud means to at least one of the food product entry or exit ports, said shroud means surrounding said conveyor means and extending at least partially into the flow path of said circulating refrigerated air in said freezing chamber, said shroud means positioned to intercept a determined part of the flow of refrigerated air inside the freezing chamber to produce an air flow condition in which there is a substantially reduced net flow of air into said freezing chamber and substantially reduced net flow of air into said freezing chamber and substantially reduced net flow of refrigerated air out of said freezing chamber.

4,056,951

PIERCED EARRING HAVING PERFUMING MEANS

Edith Black, 129 E. Beacon Road, Lakeland, Fla. 33803

Filed Mar. 1, 1976, Ser. No. 662,327
Int. Cl.[2] A44C *7/00*
U.S. Cl. 63—13 **1 Claim**

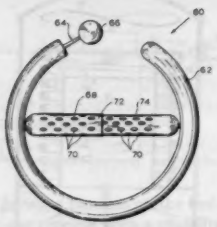
1. An earring structure for use with pierced ears comprising:

an earring member comprising a curved hollow member forming a generally circular shape;

a post extending substantially normal from a surface of said earring member, said post adapted to extend through a pierced ear;

holding means for joining to the extremity of said post for holding said earring member in proximity to an ear;

means for removing a portion of said earring member; said



removable portion having an internal void defining a chamber adapted to hold a perfuming agent therein; and

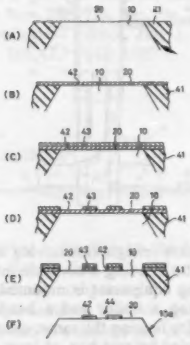
said removable portion having apertures extending therethrough and communicating between said chamber and the ambient; wherein said removable portion comprises a generally cylindrical tube disposed between opposing sides of said curved earring member, said removing means comprising openings on the inner periphery of said opposing sides for receiving portions at the ends of said tube.

4,056,952

DIAMOND BEARING MICROSCOPIC CERTIFICATE OF APPRAISAL

Kazumi Okuda, No. 55-12-807, 2-Chome, Sangenjaya, Setagaya, Tokyo, Japan

Filed Apr. 1, 1976, Ser. No. 672,835
Claims priority, application Japan, Jan. 23, 1976, 51-5887
Int. Cl.[2] A44C *17/00*
U.S. Cl. 63—32 **6 Claims**



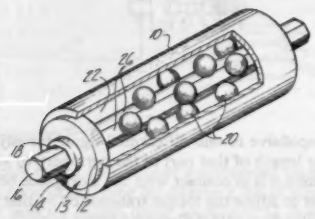
1. A diamond with an inscription, comprising a diamond gem structure having an outer surface cut and polished into a specific shape, and integrally provided means intimately and securely adhered to said gem structure for functioning as a permanent certificate of appraisal of the diamond, said means including a microscopic inscription formed at a specific position on said outer surface, said inscription having a pattern indicating the results of expert appraisal of said gem structure.

4,056,953

TORQUE LIMITING COUPLING

James L. Furlette, 984 Bal Isle, Fort Myers, Fla. 33901, and Donald A. Stadler, 310 Pirates Bight, Naples, Fla. 33940

Continuation-in-part of Ser. No. 447,471, March 4, 1974, Pat. No. 3,942,338. This application Dec. 5, 1975, Ser. No. 637,890
The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.
Int. Cl.² B65G 13/02
U.S. Cl. 64—30 D 16 Claims



1. A torque overload coupling for transmitting torque to a tubular member from a driving shaft extending axially throughout said tubular member, said coupling comprising a pair of bearings rotatively supporting said tubular member from said shaft, each of said bearings being disposed at an end of said tubular member, an intermediate portion of said shaft between said bearings having a polygonal shape in cross-section, at least one resilient spherical member disposed in said tubular member between the peripheral surface of said shaft portion of polygonal shape and the inner bore surface of said tubular member and freely rotatable therein, said resilient member having a diameter normally larger than the distance between the peripheral surface of said shaft section of polygonal shape and the inner bore surface of said tubular member but being sufficiently resilient to permit said resilient member to roll past point where distance between the peripheral surface of said shaft section and the inner bore surface of said tubular member is the narrowest.

4,056,954

APPARATUS FOR WET TREATMENT OF TRAVELLING WEBS

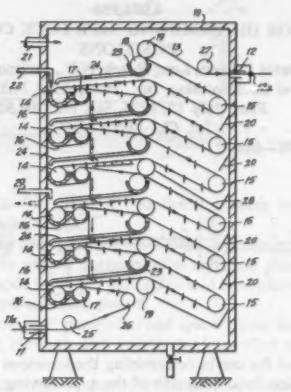
Christian August Meier-Windhorst, 2101 Lindhorst uber, Hamburg-Harburg, Germany

Division of Ser. No. 580,453, May 23, 1975, Pat. No. 4,004,879. This application Jan. 12, 1976, Ser. No. 648,349
Claims priority, application Germany, May 25, 1974, 2425374
Int. Cl.² D06B 3/02
U.S. Cl. 68—22 R 5 Claims

1. An apparatus for the continuous wet treatment of elongated materials, such as travelling textile webs and the like, particularly for washing the same, comprising:

a substantially closed housing, having admission and discharge openings, for the passage of a web therethrough;

a plurality of vertically, spaced-apart and horizontally-disposed liquid treatment stages, each of said treatment stages including a first dish-shaped container located on one side of the interior of said housing, for holding a hot liquid in which the web may be immersed, at least one first guide roller disposed at least partially within said container for guiding and effecting total immersion of the web in the hot liquid contained in the container, a second guide roller disposed on the other side of the interior of said housing, which cooperates with said first guide roller for guiding the web in a generally horizontal travel path across the interior space of said housing, a pair of cooperating and coacting squeeze rollers disposed generally between said first and second guide rollers and between which the web passes prior to immersion in said container of said treatment stage, so as to remove the liquid that adheres to the web after the latter has passed through the container of a preceding treatment stage, thereby separating the preceding and following partial treatments, and a second dish-shaped container disposed beneath said squeeze rollers for collecting excess treatment liquid removed by said squeezing rollers and including means for transmitting the collected excess treatment liquid to the first dish-shaped container of the preceding treatment



stage therebelow, said rollers cooperating to successively guide the web generally upwardly through each of said treatment stages; and

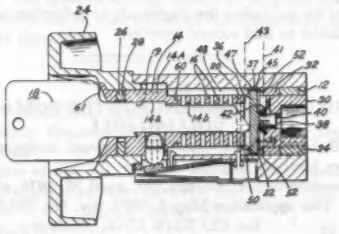
means for introducing a hot liquid to the first container of the uppermost treatment stage and for successively guiding liquid overflow from a first container onto the web in the preceding treatment stage therebelow and from said web to the first container of said preceding treatment stage.

4,056,955

IGNITION LOCK

Dwight W. Glass, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed June 11, 1976, Ser. No. 695,129
Int. Cl.² E05B 63/00
U.S. Cl. 70—422 2 Claims



1. In a tumbler lock device of the type including a cylinder with a central passage, a generally cylindrical plug rotatably inserted in the passage, said plug including a key slot with a key receiving end, said plug also including a tumbler mechanism for locking the plug in fixed non-rotatable position relative to the cylinder, the tumbler mechanism being cooperative with a specific key to effect release of the tumbler mechanism and permit rotation of the plug thereby, and said plug also including driving means operated in response to rotation of the plug, the improvement of lock security means comprising torque responsive means in the plug responsive to threshold

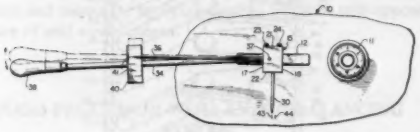
torque force on the locked plug to separate the plug into at least two portions, said torque responsive means comprising a circumferential slot on the outside surface of the plug, said slot defining a weakened section of the plug and a line of separation of plug portions upon application of torque to the plug and in excess of the threshold torque level, said slot being a separate slot intermediate the key receiving end and the tumbler mechanism.

4,056,956

TOOL FOR DETERMINING SAFE LOCK COMPONENT POSITIONS

Charles David Gilliam, Long Beach, N.Y., assignor to New York School of Locksmithing, Inc., Hempstead, N.Y.

Filed July 13, 1976, Ser. No. 704,938
Int. Cl.[2] E05B *17/0*
U.S. Cl. 70—446 **5 Claims**



1. A tool for use in determining the locations of gates in the combination lock of a safe of the type having a door with a combination lock, a combination dial for operating the lock and a rotatable handle having a tailpiece coupled thereto, the tool comprising the combination of

a support body;

a first pointer mounted on said body and extending therefrom in a first direction;

a second pointer mounted on said body and extending therefrom in a second direction separated from said first direction by a predetermined angle;

means for mounting said support body on the safe handle with said first and second pointers lying in planes which are substantially parallel with the safe door;

an elongated resilient shaft mounted at one end on said support body, the other end of said shaft forming a tool handle,

said shaft extending from said body in a direction parallel with said second pointer,

said shaft being longer than said second pointer and being sufficiently resilient to permit manual deflection of said shaft relative to said second pointer and to return to said parallel position when released; and

means for indicating the magnitude of deflection of said shaft relative to said second pointer.

4,056,957

DRIVE ARRANGEMENT FOR THE ROLLS OF A ROLLING MILL

David Robert Howard, Sheffield, England, assignor to Davy-Loewy Limited, England

Continuation of Ser. No. 681,090, April 28, 1976, abandoned. This application May 3, 1977, Ser. No. 793,331
Int. Cl.[2] B21B *37/00, 35/00*
U.S. Cl. 72—19 **5 Claims**

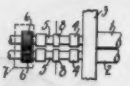
1. A rolling mill comprising: a pair of spaced apart housings each defining a window,

a pair of dissimilar diameter work rolls each rotatably supported at its ends in bearing chock assemblies mounted in said windows,

a driving system including drive means for the rolls including a pair of spindles connected one to each roll and gear means interconnecting the spindles having differential torques locked into the driving system caused by said dissimilar diameters of said work rolls,

each roll having means associated therewith for producing an electrical signal representative of the torque transmitted by the roll,

means arranged to receive and compare said signals and to produce a differential signal, and



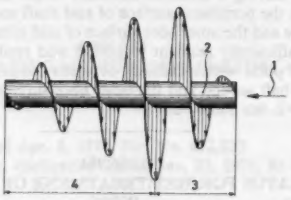
means responsive to said differential signal for adjusting the angular length of that part of the periphery of at least one roll where it is in contact with the workpiece being rolled in order to adjust the torque transmitted by that roll in the sense to reduce said differential signal.

4,056,958

METHOD AND APPARATUS FOR STRAIGHTENING OF ELONGATED WORKPIECES

Ralf Fangmeier, Solingen, and Lothar Bracht, Wuppertal, both of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed Aug. 25, 1976, Ser. No. 718,659
Claims priority, application Germany, Aug. 27, 1975, 2532622
Int. Cl.[2] B21D *3/04*
U.S. Cl. 72—98 **22 Claims**



1. A method of straightening elongated workpieces of circular or other cross section and having a longitudinal axis, comprising the steps of moving a workpiece in the direction of said axis; and subjecting a portion of the workpiece during its movement in said direction to bending forces rotating about said axis such that successive curvatures produced in an upstream zone of said portion as considered in said direction, increase to thereby surpass the yield point of the material of the workpiece and in a downstream zone of said portion, as considered in said direction, gradually decrease in such a manner that the decrease of the curvatures and the corresponding decrease of the plasticity of the workpiece occurs slower than the increase thereof.

4,056,959

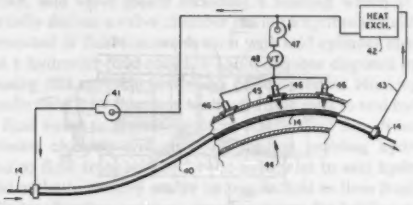
APPARATUS FOR CONVEYING HEATED ROD

George C. Ward, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Nov. 4, 1974, Ser. No. 520,268
Int. Cl.[2] B21B *45/02*; B21F *3/00*; B65H *17/32*
U.S. Cl. 72—128 **4 Claims**

1. Apparatus for conveying heated flexible metal rod continuously emitting from a rolling mill into a coiling means, comprising an elongated guide tube having an inlet end for receiving the rod from the rolling mill, an exit end through which the

rod is delivered to the coiling means and a curved portion through which the direction of travel of the rod is changed from a substantially straight upwardly inclined path into an arcuate path prior to emitting from said exit end, a liquid recirculation system for conveying a cooling liquid through said tube in the direction of rod travel therethrough, and wherein said liquid recirculation system includes a plurality of



fluid injector means spaced over a substantial segment of said curved portion of said tube for directing jets of liquid into said tube, said injector means being positioned to direct said jets both to deflect the rod in the direction of curvature of said curved portion so as to prevent the rod from contacting any portion thereof, and to impart a viscous drag force on the rod in the direction of rod travel whereby the rod is conveyed through said guide tube with a minimum of friction.

4,056,960

MEANS AND METHOD FOR BENDING ELONGATED MATERIALS INCORPORATING TWO ARMS

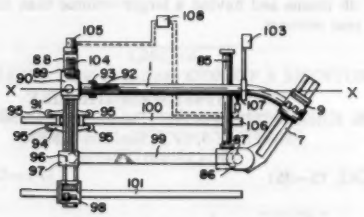
Shunpei Kawanami, 45-4 Shindo, Hiratsuka, Kanagawa, Japan

Division of Ser. No. 593,961, July 8, 1975. This application July 29, 1976, Ser. No. 709,928

Claims priority, application Japan, July 23, 1974, 49-83756

Int. Cl.² B21D *7/16*

U.S. Cl. 72—128 **7 Claims**



1. An apparatus for bending elongated materials, comprising:

a. heating means for locally heating a portion of the material;

b. an arm which is freely pivotable about an axis, the pivotable arm including means for clamping a leading portion of the material; and,

c. means for advancing the material past said heating means, and for applying a bending moment to said material in cooperation with

said pivotable arm including:

a second arm;

a bearer connected to said second arm for engaging a portion

of said material not yet advanced past the heating means;

guide means for maintaining the second arm in an orientation approximately vertical to the principal axis of the unbent portion of the material; and,

traction means for moving the second arm toward the axis of the pivotable arm.

4,056,961

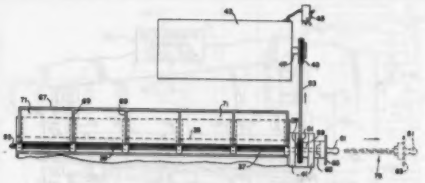
METHOD AND APPARATUS FOR FORMING CYLINDRICAL SPACERS FROM METAL BLANKS

Eugene M. Jamison, 27640 Gateway Drive, Apt. 107, Farmington Hills, Mich. 48024

Filed Nov. 8, 1976, Ser. No. 739,649

Int. Cl.² B21C *47/00*; B21D *5/12*

U.S. Cl. 72—148 **1 Claim**



1. Apparatus for forming cylindrical spacers from metal blanks comprising

a horizontally disposed base plate mountable upon a support;

longitudinally spaced uprights upon said base plate;

a die bar spaced from and parallel to said base plate spanning and secured to said supports;

a bending roll shaft parallel to and spaced from said die bar extending through and rotatively journalled upon said uprights;

said shaft having an elongated slot adapted to supportably and retainingly receive the edge of a blank;

rotative drive means connected to said roll shaft;

said blanks being guidably interposed between said roll shaft and die bar and adapted to wrap around said roll shaft during rotation thereof;

means to strip the formed spacer from said roll shaft;

said roll shaft adapted for rotation 360° approximately to complete said spacer;

said die bar being a rod of circular cross section;

and said strip means including said roll shaft adapted for longitudinal retraction relative to the formed spacer, said spacer being retained against one of said uprights, said roll shaft and die bar being spaced apart a distance approximately the thickness of said blank;

there being a series of said uprights upon said base plate, defining a plurality of bending stations along the length of said bending roll shaft; whereby a series of blanks may be assembled onto said roll shaft and simultaneously formed into spacers; and strip means including said roll shaft adapted for longitudinal retraction relative to said uprights, said spacers bearing against an adjacent upright so that retraction of said roll shaft simultaneously strips all spacers therefrom.

4,056,962

ROLLING MACHINE ASSEMBLY

Fred Gerhardt, Fresno, Calif., assignor to Edeco-West, Inc., Fresno, Calif.

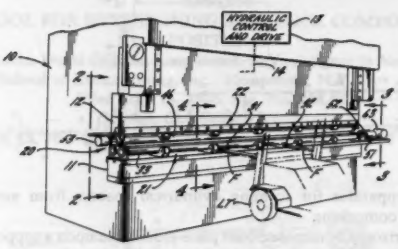
Continuation of Ser. No. 714,023, Aug. 13, 1976, abandoned. This application Mar. 10, 1977, Ser. No. 776,351

Int. Cl.² B21D *5/14*

U.S. Cl. 72—170 **10 Claims**

1. A rolling machine assembly for rolling a sheet of metal into curved cross section and for use in a press brake having an elongated bolster and a ram coextensive therewith with powered means for reciprocating the ram and with adjustable stop means for positioning the ram at a predetermined elevation comprising, in combination, a lower roll subassembly including a pair of lower rolls and a lower base member with upstanding bearing blocks for supporting the lower rolls in slightly upraised position and laterally spaced from one another, an upper roll subassembly including an upper roll and an upper base member having bearing blocks thereon for supporting the upper roll in a depending position from the ram and

centered between the lower rolls, means for detachably securing the lower base member to the bolster, means for detachably securing the upper base member to the ram, a lower hydraulic motor secured to the lower base member for driving the lower rolls, an upper hydraulic motor secured to the upper base member for driving the upper roll, the motors being of the positive displacement type, means for metering hydraulic fluid to the motors for rotation of the rolls at substantially the same



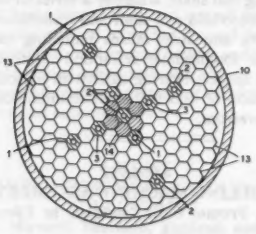
peripheral speed, the lower base member having symmetrically located sockets for reception of the tines of a forklift truck so that when the upper roll is in nested position with respect to the lower rolls, and the securing means are disengaged, the subassemblies may be lifted out of the press brake as a unit by the forklift truck to free the press brake for other usage, and with the reverse procedure being effective for re-installation of the subassemblies in the press brake.

4,056,963

MEANS OF DETERMINING EXTRUSION TEMPERATURES

Robert E. McDonald, Oliver Springs, and Domenic A. Canonico, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 21, 1976, Ser. No. 752,944
Int. Cl.[2] B23C *23/08*
U.S. Cl. 72—253 R **2 Claims**



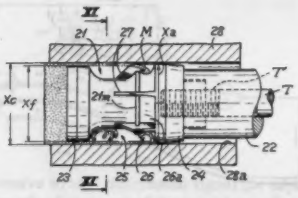
1. In an extrusion process comprising the steps of fabricating a metal billet, heating said billet for a predetermined time and at a selected temperature to increase its plasticity, and then forcing said heated billet through a small orifice of an extrusion press to produce a desired extruded product, the improvement comprising the steps of randomly inserting a plurality of small metallic thermal tabs at different cross sectional depths and axial positions in said billet as a part of said fabricating step, and examining said extruded product at each thermal tab location for determining the crystal structure of each extruded thermal tab thus revealing the maximum temperature reached in each respective tab location section of the extruded product during extrusion, whereby the thermal profile of said extruded product may be determined.

4,056,964

APPARATUS FOR METAL EXTRUSION

Tadashi Shibasaki, Nagoya, and Tsuguo Ieda, Kasugai, both of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Jan. 15, 1976, Ser. No. 640,269
Int. Cl.[2] B21C *23/04, 27/00, 33/00, 35/06*
U.S. Cl. 72—273 **7 Claims**



1. A disc for use in metal extrusion by pushing a billet in the bore of a main container through an extruder die, comprising:

a rear disc portion having an outer diameter slightly smaller than the inner diameter of the main container;

a front disc portion having an outer diameter slightly smaller than that of said rear disc portion;

a connecting portion between said front and rear disc portions;

rib means for splitting billet shell passing between the main container and said front disc portion into longitudinal strips, said rib means comprising a plurality of ribs, longitudinally disposed, circumferentially apart, said ribs extending forwardly from said rear disc portion between said connecting portion and said main container, and ending at a position substantially intermediate said two disc portions, rear recesses being defined between said rib means, said connecting portion and the main container; and

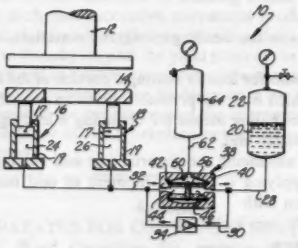
a front recess defined between said rear recesses, said front disc portion, said connecting portion and the main container, said front recess being substantially in front of said rib means and having a larger volume than that of said rear recesses.

4,056,965

PRESS SYSTEM OR THE LIKE

Elmer F. Heiser, 8313 Pin Oak, Parma, Ohio 44130

Filed Nov. 5, 1975, Ser. No. 628,886
Int. Cl.[2] B21D *24/02*
U.S. Cl. 72—351 **30 Claims**



1. A press system or the like comprising hydraulic cylinder means for applying force to a member, said hydraulic cylinder means including a piston and cylinder which are relatively movable through an operating stroke to vary the volume of a variable volume cylinder chamber defined by said piston and cylinder, means for supplying hydraulic fluid under pressure to and conducting hydraulic fluid from said cylinder chamber to

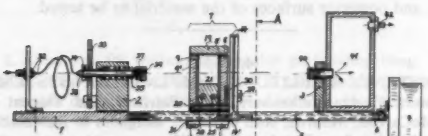
effect relative movement between said piston and cylinder and a variation in the volume of said variable volume cylinder chamber, valve means connected in fluid communication with said variable volume cylinder chamber for maintaining at least a first fluid pressure in said variable volume cylinder chamber during a first portion of an operating stroke and for maintaining at least a second fluid pressure in said variable volume cylinder chamber during a second portion of an operating stroke, said valve means including a housing which at least partially defines a valve chamber having a hydraulic fluid inlet connected in fluid communication with said cylinder chamber and a hydraulic fluid outlet, a valve member disposed in said housing and movable between a closed position blocking hydraulic fluid flow from said hydraulic fluid inlet to said hydraulic fluid outlet to thereby block hydraulic fluid flow from said cylinder chamber and an open position enabling hydraulic fluid to flow from said hydraulic fluid inlet to said hydraulic fluid outlet to thereby enable hydraulic fluid to flow from said cylinder chamber, pressure chamber means for holding a fluid under pressure, said valve member being urged toward the closed position under the influence of the fluid pressure in said pressure chamber means, said valve member being movable from the closed position to the open position under the influence of the pressure of hydraulic fluid in said valve chamber and against the influence of the fluid pressure in said pressure chamber means, and means for varying the fluid pressure in said pressure chamber from one fluid pressure during said first portion of an operating stroke to another fluid pressure during said second portion of an operating stroke to vary the force urging said valve member toward the closed position and the magnitude of the hydraulic fluid pressure required in said valve chamber to effect movement of said valve member from said closed position to said open position.

4,056,966

APPARATUS FOR CALIBRATION OF A MOISTURE ANALYZER

Peter H. Ketelsen, 2162 Georges Lane, Warrington, Pa. 18976

Filed Jan. 21, 1977, Ser. No. 760,968
Int. Cl.² G01N *31/00*
U.S. Cl. 73—1 G **1 Claim**



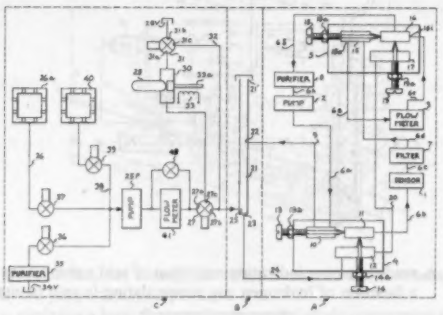
1. A device for introducing a gaseous mixture of known moisture content into an analyzer for calibration purposes comprising a cartridge consisting of a tubular member and a wire longitudinally mounted within the tubular member, the wire being coated with a substance having chemically bonded moisture which is released when the substance is heated, means for connecting the cartridge to a source of gas at one end and to an analyzer at the other end, means mounting the cartridge and a carriage for movement along the length of the cartridge, heater means mounted on the carriage for heating a portion of the cartridge along its length and means for advancing the carriage along the length of the cartridge at a uniform speed.

4,056,967

PNEUMATIC SYSTEM FOR A GAS SENSOR

John A. Roberts, Lynnfield, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed July 16, 1976, Ser. No. 705,988
Int. Cl.² G01N *31/00*
U.S. Cl. 73—1 G **18 Claims**



1. A pneumatic system for controlling admission of a gas sample to a gas sensor comprising:

a. a series loop cicuit including a gas sensor, a flow meter, a pump, a first manifold valve operably connected in the series circuit downstream from said pump to regulate gas flow between it and the sensor, a second manifold valve operably connected downstream from the sensor between it and the pump to regulate gas flow to said flow meter,

b. a vented gas sample input chamber including an overflow gas input orifice connected to receive gas from a point in said series loop circuit between said pump and a first flow restricting needle valve in said first manifold valve, an outlet orifice connected to deliver gas to the first manifold valve, and a sample gas inlet orifice disposed between said overflow input orifice and said outlet orifice and operable to deliver a gas sample into said input chamber, and

c. a bleeder line operably connected between the first and second manifold valves to bypass some gas received from the gas sample input chamber around said sensor, whereby said pump is effective when operated in said series loop circuit to force gas through said manifold valves, flow meter and sensor and to cause gas to flow continuously through the bleeder line and said manifold valves both during intervals when a sample gas is being introduced to the series loop and during intervals when sample gas is not being fed into the loop.

4,056,968

HYDROGEN PROBE SYSTEM

Joseph D. Winslow, Jr., Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 22, 1975, Ser. No. 643,284
Int. Cl.² G01N *7/10*
U.S. Cl. 73—19 **10 Claims**

1. A hydrogen probe system comprising:

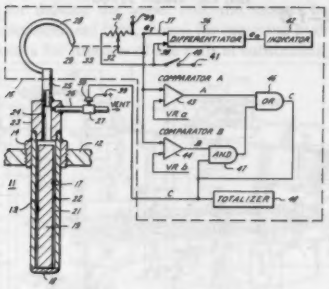
a. a ferrous metal probe body adapted to be exposed to a corrodant, said body having an enclosed fluid-tight internal cavity for collecting hydrogen gas under superatmospheric pressure buildup due to the accumulated hydrogen gas produced by action of the corrodant on said body;

b. a pressure sensor carried on said body and connected by a fluid channel to said cavity, said sensor providing an output function which corresponds to the superatmospheric pressure of the hydrogen gas accumulated in said cavity;

c. valve means carried on said body for venting hydrogen gas from said cavity;

d. control means receiving the output function and with a

snap action opening and closing said valve means for venting to the atmosphere the hydrogen gas in said cavity from a certain superatmospheric pressure buildup to a certain lesser superatmospheric pressure; and



e. readout means indicating actuation of said valve means as a function of hydrogen gas accumulating in said cavity.

4,056,969

DETECTION OF CONCEALED METALLIFEROUS DEPOSITS, HYDROCARBONS AND EXPLOSIVES

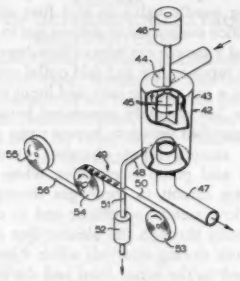
Anthony Rene Barringer, Willowdale, Canada, assignor to Barringer Research Limited, Rexdale, Canada

Filed Apr. 23, 1976, Ser. No. 679,622

Claims priority, application Canada, Apr. 28, 1975, 225851

Int. Cl.[2] B01D *46/00;* **C12K** *1/04;* **G01N** *33/00;* **G01V** *5/00*

U.S. Cl. 73—28 **3 Claims**



1. Geochemical prospecting apparatus comprising:

a. means for collecting a plurality of samples primarily consisting of surficial particulates selected from at least one of the following sources:

i. particulates lying on the surface of the soil,

ii. particulates lying on transpiration surfaces of vegetation, and

iii. particulates suspended in a body of water at the surface thereof,

b. said collecting means comprising an elongated flexible tube having an open end positioned in close proximity to the surficial particulates to be collected, and means for applying suction to said tube,

c. said collecting means including means for moving the collected particles in a fluid stream to a receiving station,

d. means for filtering the particles in said fluid stream so that the particles retained for analysis are primarily of diameters of below about 200 microns, and

e. means coupled to said collecting means for removing from the collected particles, particles primarily of sizes of below about 50 microns, whereby the particles retained for analysis are primarily between about 50 – 200 microns in size.

4,056,970

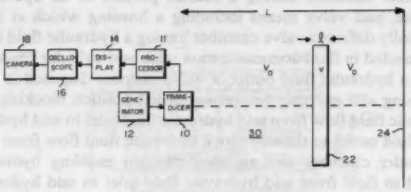
ULTRASONIC VELOCITY AND THICKNESS GAGE

Bruce D. Sollish, Rehovot, Israel, assignor to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Oct. 30, 1975, Ser. No. 627,386

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—629 **6 Claims**



1. A method for determining the velocity of propagation of a particular material, comprising the steps of:

providing a reflecting surface in a fluid medium having a known velocity of propagation;

recording the position in time of an echo received from said reflecting surface utilizing a transducer to create at least one ultrasonic pulse which is reflected off said reflecting surface;

placing the material to be tested in said fluid between said transducer and said reflecting surface;

transmitting at least one ultrasonic pulse from the transducer and receiving echoes of said pulse reflected from said material and from said reflecting surface;

recording the position in time of the echoes corresponding to the anterior and posterior surfaces of said material and the new position in time of the echo from said reflecting surface; and

determining the velocity of propagation of said material by utilizing the positions in time of said echoes, according to the equation

$$V/V_0 = 1 - \Delta T_2/\Delta T_1$$

where

V is the propagation velocity in the material to be tested,

V_0 is the propagation velocity in the fluid medium,

ΔT_2 is the round trip propagation time from the transducer to the reflecting surface with the material to be tested positioned somewhere in between, minus the round trip propagation time from the transducer to the reflecting surface with said material removed, and

ΔT_1 is the round trip propagation time between the anterior and posterior surfaces of the material to be tested.

4,056,971

DISTANCE AMPLITUDE COMPENSATION SYSTEM

Howard E. van Valkenburg, New Fairfield, and Vincent P. McCarroll, Monroe, both of Conn., assignors to Automation Industries, Inc., Los Angeles, Calif.

Filed May 10, 1976, Ser. No. 684,679

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—629 **17 Claims**

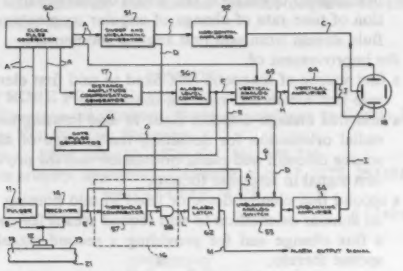
1. A distance amplitude compensation system for comparing signals transmitted through a workpiece with a reference signal having a time varying amplitude, said system including:

receiver means for receiving said transmitted signals and converting them to video signals and having an output circuit,

distance amplitude compensation signal generator means for generating a reference signal having a time varying amplitude for compensating for the variation of said transmitted signals in the workpiece, and having an output circuit, and

comparator means having an input circuit coupled to the

output circuit of said receiver means and an input circuit coupled to the output circuit of said distance amplitude



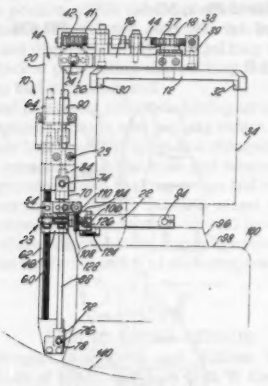
compensation generator for comparting said video signals with said reference signal.

4,056,972

TESTING OF INACCESSABLE PARTS

Robert Alan Charles Bromwich, Marlow, England, assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed June 29, 1976, Ser. No. 700,946
Claims priority, application United Kingdom, July 4, 1975, 28364/75
Int. Cl.² G01N 29/04
U.S. Cl. 73—620 4 Claims



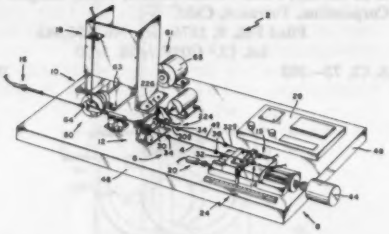
1. Apparatus for testing inaccessable parts comprising:
a. a clamp which can be clamped in place on the part to be tested or another part fixed in relation to that part to be tested,
b. a hingeable arm rotatably mounted on said clamp,
c. means for hingeing said arm from a substantially straight configuration for insertion through restricted regions to a bent configuration for use,
d. means for rotating said arm relative said clamp, and
e. a probe arm carried on the hingeable part of said hingeable arm and means for moving the probe arm in directions parallel to the axis of rotation and tangential to circles whose axes are coincident with the axis of rotation of said hinged arm relative said clamp once the hinged arm is in the bent configuration,
whereby during rotation of the hingeable arm a testing probe carried by said probe arm can be taken progressively over the surface of said part being tested.

4,056,973

TESTING VISCOELASTIC SOLIDS

Dusan C. Prevorsek; Young D. Kwon, and Raj K. Sharma, all of Morristown, N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 13, 1976, Ser. No. 750,039
Int. Cl.² G01N 3/34
U.S. Cl. 73—91 30 Claims



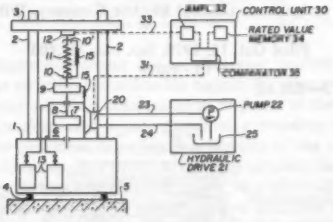
19. A method for testing viscoelastic material and measuring selected properties, comprising:
a. applying a basic first cyclic sinusoidal strain component to the material to be tested, having predetermined amplitude and frequency;
b. simultaneously applying a superimposed second sinusoidal strain component to the material to be tested, having predetermined amplitude and frequency; and
c. transforming the stress resulting in the material from the strain applied by the first and second cyclic strain component into a composite electrical stress signal.

4,056,974

METHOD AND HYDRAULIC TESTING APPARATUS FOR PERFORMING RESONANCE TESTS

Friedrich Klinger, Garmisch-Partenkirchen; Josef Beran, Ober-Ramstadt, and Jan Brezina, Darmstadt, all of Germany, assignors to Carl Schenck AG, Darmstadt, Germany

Filed May 17, 1976, Ser. No. 686,712
Claims priority, application Germany, May 23, 1975, 2522890
Int. Cl.² G01N 3/32
U.S. Cl. 73—92 14 Claims



1. In a method for resonance testing of materials and structural elements in which a test sample constitutes with the members of a testing apparatus a unit including a load mechanism with a single cylinder piston arrangement forming two cylindrical chambers and a pressure medium in said load mechanism, and an oscillatory system driven at resonance, the improvement comprising the steps of incorporating said pressure medium in the load mechanism as an elastic element of said oscillatory system, adjusting the spring rate of the pressure medium relative to the spring rate of the test sample or relative to the spring rate of the entire oscillatory system of the testing apparatus, further adjusting the spring rate of the pressure medium also relative to the mass of said oscillatory system, and supplying the pressure medium to said single cylinder piston

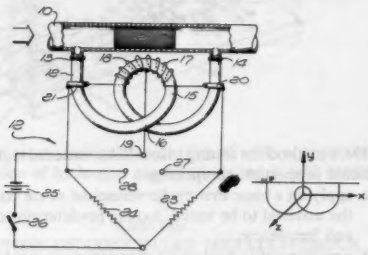
arrangement for exciting the oscillation of said oscillatory system, at high pressure in said single cylinder piston arrangement, whereby any pressure difference between supply pressure of the system and the pressure in the single cylinder piston arrangement at the time of pressure supply is minimized.

4,056,975

MASS FLOW SENSOR SYSTEM

Dan B. LeMay, Palos Verdes Estates, Calif., assignor to Tylan Corporation, Torrance, Calif.

Filed Feb. 9, 1976, Ser. No. 656,543
Int. Cl.[2] G01F *1/68, 5/00*
U.S. Cl. 73—202 **25 Claims**



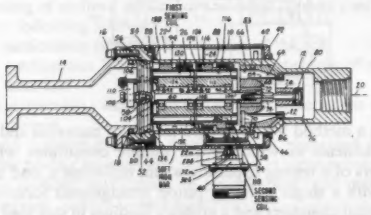
1. In apparatus for measuring the rate of mass flow of a fluid in a first conduit wherein a sensing conduit is communicatingly connected thereto by inlet means and outlet means and including self heating sensor elements on said sensing conduit intermediate said inlet means and outlet means, means for heating said sensor elements and detecting a temperature differential between said sensor elements, the improvement according to which said sensing conduit defines at least one helix loop intermediate said inlet means and outlet means and forming a continuous passageway providing reversal flow of said fluid therebetween, said loop being substantially in a plane parallel to the direction of flow of fluid in said first conduit.

4,056,976

MASS RATE OF FLOW METER

George Lee Hildebrand, West Boxford; Thomas Till Sleeper, Marblehead; William Allen Healey, Wayland; Stuart Jeffery Hall, Nahant, all of Mass., and Richard A. Pfuntner, Alfred, Maine, assignors to General Electric Company, Wilmington, Mass.

Filed Oct. 12, 1976, Ser. No. 731,405
Int. Cl.[2] G01F *1/82*
U.S. Cl. 73—231 M **8 Claims**



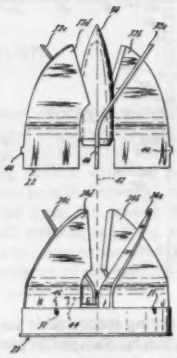
1. In a mass rate of flow meter, having:
a housing,
first means for passing a fluid stream and having a first element rotating at the average angular velocity of the fluid stream,
second means for receiving the fluid stream and for removing substantially all of the angular velocity therefrom, having a second element having a first angular orientation at a first angular momentum of the fluid stream, and for translating through an angular displacement from said first angular orientation and which displacement is a function of time rate of change of angular momentum of the fluid stream from said first angular momentum,
the improvement of:
a first source of magnetic flux fixed to said first element of said first means and rotating therewith,
a first flux change detector fixed to said housing on a first radial orientation for detecting the passage of said first source through said radial orientation and for providing a first signal in response thereto,
a second flux change detector fixed to said housing having an annular orientation to said second means for detecting a flux change and for providing a second signal in response thereto,
a second source of flux having a third element fixed to said first element of said first means and rotating therewith and a fourth element fixed to said second element of said second means and displaced therewith, and providing a source of flux change when both said third and fourth elements are in conjunction, which change is detected by said second detector,
an elapsed time meter which is turned on by said first signal and is turned off by said second signal, thereby to provide an indication of elapsed time which is a function of the time required for said first element to rotate through the displacement of said second element, which elapsed time is a function of the mass rate of flow of the stream.

4,056,977

SWIRLER FOR A FLUID FLOWMETER AND METHOD OF MAKING SAME

Leonard P. Gau, Birmingham, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 29, 1976, Ser. No. 681,628
Int. Cl.[2] G01F *1/32*
U.S. Cl. 73—272 R **17 Claims**



1. In a fluid swirler or like device comprising a plurality of blades which are both axially and circumferentially overlapping, the combination of:
a first element containing selected ones of said blades which are circumferentially non-overlapping; and
a second element containing other selected ones of said blades which are circumferentially non-overlapping;
said two elements being assembled such that at least one blade of one of said elements circumferentially and axially overlaps a blade of the other of said elements;
said first element including a central hub joining radially inner peripheral edge portions of the blades thereof and an integral ring joining outer peripheral edge portions of the blades thereof, said second element comprising an integral central hub joining radially inner peripheral edge portions

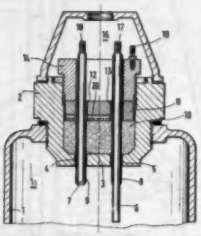
of the blades thereof, said two hubs engaging each other, and including locating slots in said ring and locating tabs on the blades of said second element disposed in said locating slots.

4,056,978

PROBE FOR MEASURING LIQUID LEVELS

Heino Zimmermann, Bremen, Germany, assignor to Gustav F. Gerdts KG, Bremen, Germany

Filed June 10, 1976, Ser. No. 694,736
Claims priority, application Germany, July 17, 1975, 2531915
Int. Cl.² G01F *23/24*
U.S. Cl. 73—304 R 6 Claims



1. A probe for detecting the level of electrically conductive liquids in a walled container having an inner chamber comprising:

a probe housing having a bottom portion for insertion into the chamber of the walled container, and an inner chamber;

insulating packing means secured in said housing on said bottom portion within the inner chamber;

at least one compensating electrode having an insulating jacket and disposed through said packing means, the insulating jacked penetrating said packing means and extending into said container; and

at least one measuring electrode having an insulating jacket and disposed through said packing means, said measuring electrode being spaced apart and elongated with respect to said compensating electrode and wherein its insulating jacket penetrates said packing means and extends into said container to substantially the same extent as said jacket of said compensating electrode with said jacket of said measuring electrode extending into said container at least as far as the insulating jacket of said compensating electrode.

4,056,979

LIQUID LEVEL SENSOR

Edgar A. Bongort, Southfield, and William T. Cruickshank, Pontiac, both of Mich., assignors to B/W Controls Inc., Birmingham, Mich.

Filed Oct. 31, 1975, Ser. No. 627,518
Int. Cl.² G01F *23/12;* H01H *36/02*
U.S. Cl. 73—313 36 Claims

1. A liquid level sensor comprising, in combination:

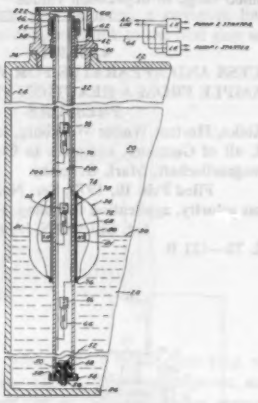
a guide tube for vertical positioning in the liquid whose level is to be sensed;

a float externally surrounding the guide tube for free rotatable and longitudinal movement thereon to rise and fall with the liquid level;

a reed switch in the guide tube having its reeds extending substantially parallel to the axis of the guide tube;

means for establishing a magnetic bias field across the reeds insufficient to close them but sufficient to hold them closed;

means on the float for establishing a symmetrical toroidal magnetic field about the guide tube having leading and trailing field portions of opposite direction for sweeping the switch reeds and augmenting the bias field to close the reeds as the float passes the switch moving in one direction and sweeping and overcoming the bias field opening the switch reeds as the float passes the switch moving in



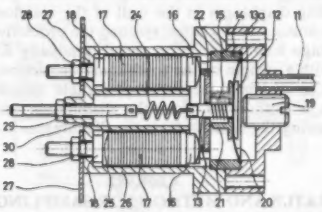
the opposite direction at substantially the same point where the reeds were closed.

4,056,980

DEPRESSION SENSOR FOR AN ELECTRONIC IGNITION ADVANCE DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Louis Chateau, Rosny-sous-Bois, France, assignor to Ducellier & Cie, Creteil Cedex, France

Filed July 16, 1976, Ser. No. 705,879
Claims priority, application France, July 24, 1975, 75.23086
Int. Cl.² G01L *7/08, 9/02*
U.S. Cl. 73—398 AR 4 Claims



1. A depression sensor for an electronic ignition advance device for an internal combustion engine, the sensor including a membrane which is deformable in response to the value of said depression, said sensor comprising resistive means of which the ohmic value varies as a function of the value of a force which is applied to them, and an electronic control circuit controlled by said resistive means, said electronic control circuit being constituted by one transistor polarized by a voltage divider and thermal stabilizing bridge connected between the positive pole and the negative pole of the sensor, and another transistor of which the collector and the emitter are in series with said resistive means and a resistance of fixed value, and of which the base is connected to another resistance which is connected by one of its ends to the collector of the first transistor and by its other end to the negative pole of the sensor, said resistive means being connected between the positive pole of the sensor and the emitter of the first transistor so as to be supplied with stabilized voltage by means of said divider and thermal stabilizing bridge, said resistance of fixed value being connected by one of its ends to the emitter of said one transistor and by its other end to the collector of said other transistor so as to cause said output voltage from the sensor to vary linearly, whereby variations in the value of said depres-

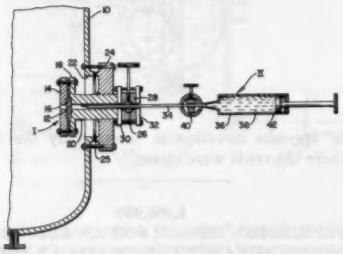
sion applied to said deformable membrane will vary said force applied to said resistive means and consequently will vary an output voltage of said electronic control circuit linearly with a determined range of depression values.

4,056,981

PROCESS AND APPARATUS FOR WITHDRAWING A SAMPLE FROM A REACTION VESSEL UNDER PRESSURE

Josef Kalka, Herten; Walter Waskönig, and Karl Lueg, both of Marl, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Feb. 10, 1977, Ser. No. 767,422
Claims priority, application Germany, Feb. 19, 1976, 2606687
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—421 B **10 Claims**



1. A process for the withdrawal of a sample from a reaction vessel under pressure and containing a dissolved and/or emulsified solid-liquid dispersion which comprises a liquified gas and which is sensitive to mechanical stress, which comprises the steps of providing a cannula and communicant connected pressure-proof injection syringe filled with an inert protective fluid; passing the cannula through an elastic pressure-proof self-sealing diaphragm in the wall of the reaction vessel and into the interior of the latter; ejecting the protective fluid from the syringe into the reaction vessel; gradually filling the syringe with a sample of the solid-liquid dispersion; sealing the syringe to maintain the captured sample therein when the cannula is withdrawn from the diaphragm; and thereafter withdrawing the cannula from the diaphragm.

4,056,982

APPARATUS AND METHOD FOR SAMPLING A LIQUID

Richard Warren Jones, 26 Bucknell Rd., Bicester, Oxon, England

Filed Dec. 13, 1976, Ser. No. 749,990
Claims priority, application United Kingdom, Dec. 19, 1975, 52233/75
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—421 B **12 Claims**

1. Apparatus for sampling a liquid comprising,

i. a housing having an inlet for liquid to be sampled and an outlet for a sample;

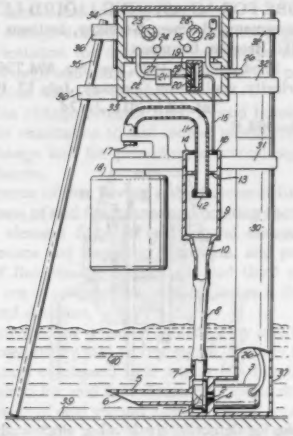
ii. a displacer of liquid in the housing linking the inlet to an entry to a working chamber;

iii. the working chamber having plenum of a sectional area such that liquid being displaced into the working chamber through the entry is reduced in velocity and enabled to form a uniform rising surface;

iv. drive means for the displacer which, in a first state, causes the displacer to drive liquid from the inlet into the chamber by way of the entry and, in a second state causes the displacer to allow liquid in the working chamber to pass from the entry to the inlet;

v. a sample duct joining the outlet to a sample tube projecting into the plenum, the sample tube defining an opening disposed in an opposite direction to the upward direction of movement of a free surface of liquid displaced through the entry into the working chamber by the displacer with the drive means in the first state; the opening being sized such that a sensible pressure increase is created within the container when displaced liquid obturates the opening;

vi. a sensor for detecting pressure changes in the plenum; and



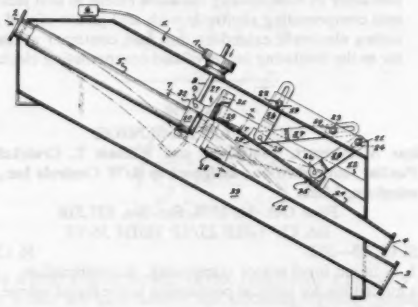
vii. switch means linking the sensor to the drive means so that on the sensor detecting a pressure increase in the plenum due to obturation of the sample duct by a liquid surface the drive means is subsequently caused to switch from the first state to the second.

4,056,983

FLOW DIVERSION SAMPLER

Flavio J. Mazzetti, 6580 Arequa Ridge Lane, Colorado Springs, Colo. 80919

Filed Sept. 3, 1976, Ser. No. 720,135
Int. Cl.[2] G01N *1/20*
U.S. Cl. 73—423 R **1 Claim**



1. A sampling device for diverting a confined stream of fluid material from a first to a second course, comprising:

a housing disposed in series with the stream flow and having a single inlet defined by an inwardly projecting flexible conduit for directing the stream flow interiorly of the housing, said flexible conduit having a discharge mouth;

and wherein said housing includes first and second discharge ports, said second discharge port defined by a duct projecting interiorly of the housing;

drive means attached to the said flexible conduit and disposed to move the said discharge mouth into alignment with the said duct, wherein said duct includes at least one

movable wall whereby the size of the duct inlet may be altered;

and including cover means operably connected to the drive means, disposed and positioned to cover the duct inlet when the flexible conduit discharge mouth and the duct inlet are misaligned.

4,056,984

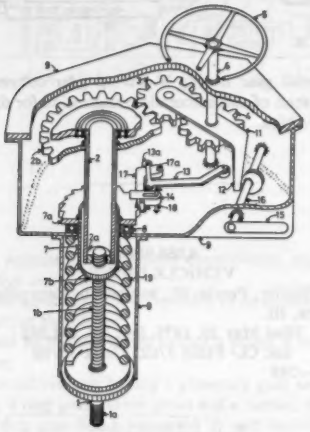
VALVE OPERATING MECHANISM

Brian Vaughan Kenealy, 2 Glamour Avenue, Blairgowrie, Randburg 2001, Transvaal, South Africa

Filed Dec. 30, 1974, Ser. No. 537,394

Int. Cl.[2] F16H *27/02*

U.S. Cl. 74—89.15 7 Claims



1. A manually energised operating mechanism for a valve including a threaded rod movable under manual control with general mechanical advantage longitudinally at low speed between a valve open position and a valve closed position as well as any intermediary position, means biasing the rod with stored mechanical energy either to the open or to the closed position, without any external power source, a control unit rotatable on the rod to urge the rod towards the desired valve position with or against the action of the bias, a rotatable axially fixed ratchet unit embracing the rod and adapted frictionally to abut the control unit to inhibit reverse movement thereof through the agency of the bias yet so proportioned as to allow a controlled slipping to occur when reverse rotation is manually applied and reduces the frictional effect between the control unit and the ratchet unit to allow the rod to move in the reverse direction, a pawl limiting rotation of the ratchet with the control unit during opening of the valve (alternatively closing of the valve), and means to release the pawl to allow the biasing means to apply the manual energy stored therein to urge the rod towards the desired position by causing rotation of the manual control in the reverse direction, the pitch of said threaded rod being such that an axial force applied thereto causes relative rotation therebetween.

4,056,985

HINGE STRUCTURES

Anthony Charles Worrallo, 15 Sprott Road, Kohlmarama, Auckland 5, New Zealand

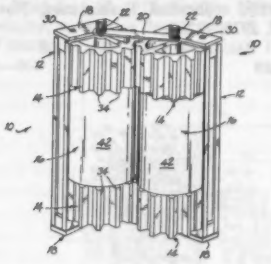
Filed Feb. 18, 1976, Ser. No. 659,124

Claims priority, application New Zealand, Feb. 21, 1975, 176729

Int. Cl.[2] F16H *55/04;* E05D *9/00*

U.S. Cl. 74—435 9 Claims

1. A hinge structure comprising a first base element, a first gear segment non-rotatably carried by said first base element and having an axis of rotation, a second base element, a second gear segment having an axis of rotation, said second segment being non-rotatably carried by the second base element and meshing with the first gear segment, a swinging link, axle means pivotally connecting said link to the first gear segment



for swinging motion with respect to the first base element about said axis of rotation of the first gear segment, and axle means connecting said link to the second gear segment for swinging motion with respect to said second base element about said axis of rotation of the second segment.

4,056,986

TORQUE CONVERTERS

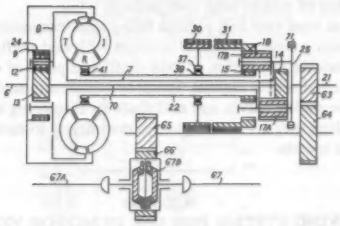
Howard Frederick Hobbs, Rugby, England, assignor to Variable Kinetic Drives, Ltd., Warwickshire, England

Filed Apr. 14, 1975, Ser. No. 567,771

Claims priority, application United Kingdom, Apr. 22, 1974, 17438/74

Int. Cl.[2] F16H *47/08*

U.S. Cl. 74—688 10 Claims



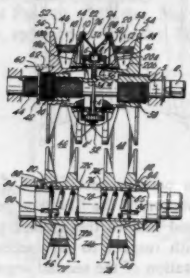
1. Power transmission apparatus comprising a torque converter having an input shaft, an impeller connected to the input shaft, an output turbine, a reactor and a circulatory turbine disposed in the flow path between the impeller and output turbine, a first gearing connecting the circulatory turbine to the input shaft so that the said circulatory turbine will always rotate with and in the same direction as the said impeller, a second gearing connecting the first gearing to the output shaft and to a stationary part, said second gearing including a part which is acted on by a friction brake so that it can be connected with or disconnected from said stationary part, said second gearing including an internally toothed ring gear acted on by said second gearing brake, a sunwheel, and pinions meshing with the ring gear and the sunwheel, the first unidirectional detent acting between a part of the second gearing and said stationary part, and the second unidirectional detent acting between the reactor and the second gearing, said sunwheel being connected to each of said detents, said detents being in series so that forwards rotation of a part of the second gearing drives the reactor in a forwards direction and negative torque on either the reactor or said part of the second gearing can act on said stationary part.

4,056,987

MECHANISM FOR PARALLEL CONNECTION OF INFINITELY-ADJUSTABLE LOOPING GEARINGS

Georges Hoffmann, 35, rue des Roses, Luxembourg-Ville, Luxembourg

Filed Nov. 17, 1975, Ser. No. 632,830
Claims priority, application Luxembourg, Nov. 20, 1974, 71316; Aug. 26, 1975, 73259
Int. Cl.[2] F16H *37/06, 37/08*
U.S. Cl. 74—689 11 Claims



1. A power transmission mechanism for the parallel connection of infinitely-adjustable pulleys with at least two belt pulleys mounted axially side by side on a common shaft comprising:

at least two belt pulleys, each having at least one axially displaceable half which determines the effective pulley diameter;

an equalizing mechanism comprising differential gearing means for automatically displacing said at least one displaceable half of a pulley to nullify any asynchronism occurring in the running of said pulley relative to the other of said at least two pulleys;

said at least two belt pulleys being inter-connected via said gearing means coaxially in series with said shaft and being rotatable in relation to said shaft, and pairs of oppositely pitched screw threads operably connecting said displaceable pulley halves and said shaft for displacing said pulley halves whenever said pulleys commence to turn at different speeds.

4,056,988

DRIVING SYSTEM FOR USE IN MOTOR VEHICLE

Seitoku Kubo; Kojiro Kuramochi; Kunio Morisawa, and Kiyoshi Ohnuma, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 673,543, April 5, 1976. This application Aug. 6, 1976, Ser. No. 712,167
Claims priority, application Japan, Aug. 8, 1975, 50-95888; Aug. 8, 1975, 50-95889
Int. Cl.[2] F16H *37/08, 57/10*
U.S. Cl. 74—695 14 Claims

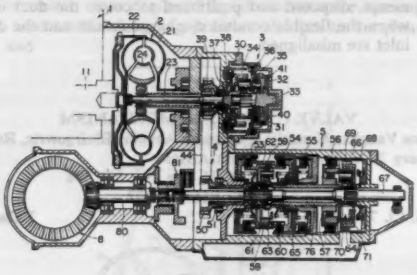
1. In a driving system acting in conjunction with a motor vehicle engine having an output shaft, the improvement comprising:

a torque convertor coaxially coupled to the output shaft of the engine and having an output shaft,

transfer means having a driving gear coaxially coupled to the output shaft of the torque convertor and a driven gear coupled to said driving gear,

overdrive means having a planetary gear mechanism also coaxially coupled to the output shaft of said torque convertor and an output shaft coaxially but removably coupled to said driving gear of said transfer means,

an automatic transmission coaxially coupled to said driven gear of said transfer means, having a planetary mechanism and friction engaging means to provide the desired mode of operation, and an output shaft on which said driven gear of said transfer means is coaxially mounted, and



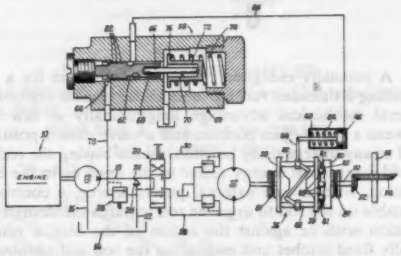
a differential gear having a driving gear coupled to the output shaft of said automatic transmission for driving the motor vehicle.

4,056,989

VEHICLE DRIVE

Walter M. Shaffer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 28, 1976, Ser. No. 691,053
Int. Cl.[2] F16H *3/02, 47/00, 15/08*
U.S. Cl. 74—745 4 Claims



1. A drive system for a vehicle or the like comprising:

a fluid pump;

means for driving said fluid pump;

a fluid motor;

means operatively connecting said fluid pump and fluid motor so that driving of said fluid pump drives said fluid motor; and

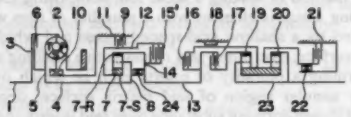
a variable speed transmission having an infinite number of ratios operatively coupled with said motor, wherein the variable speed transmission comprises an input disc driven by said motor, an output disc, and wheel means rollingly interconnecting the input disc and output disc, with the wheel means being variable in position relative to the input disc and output disc to vary the speed of the output disc in relation to the speed of the input disc, and means for varying the position of the wheel means relative to the input and the output discs to in turn vary the speed of the output disc in relation to the speed of the input disc, wherein the means varying the position of the wheel means comprise means operatively coupled with said wheel means and responsive to fluid pressure in said means operatively coupling said fluid pump and fluid motor.

4,056,990

AUTOMATIC MULTI-SPEED TRANSMISSION AND OVERDRIVE COMBINATION

Mitsuru Hatano, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Jan. 19, 1976, Ser. No. 650,026
Claims priority, application Japan, Jan. 23, 1975, 50-10234
Int. Cl.[2] F16H *57/10*
U.S. Cl. 74—781 R 2 Claims



1. An automatic multi-speed transmission and overdrive combination comprising:

a. engine input shaft for connection to an engine and supplying drive therefrom;

b. a fluid torque converter having a pump, a turbine, and a stator;

c. an overdrive unit having a planetary gear set with a sun gear, a ring gear, pinion gears and a carrier, said sun gear and ring gear being separated by and meshing with the pinion gears supported by the rotary carrier,

first brake means engagable with and actuable to prevent rotation of said sun gear, and

normal drive clutch means connected to said sun gear for being actuated during normal drive of said combination;

d. a multi-speed change gear unit;

e. first connection means connecting said engine input shaft with said pump of the fluid torque converter for driving said converter;

f. a turbine shaft connecting said turbine of the fluid torque converter with said carrier of said planetary gear set of said overdrive unit for driving said planetary gear set;

g. a second input shaft connecting to said multi-speed change gear unit and selectively connectable to said normal drive clutch means and to said ring gear of the overdrive unit, whereby said multi-speed change gear unit may be normally driven by said sun gear of the planetary gear set and may be driven by said ring gear of the planetary gear set during non-actuation of said normal drive clutch means;

h. an output shaft for supplying output drive from said multi-speed change gear unit to an automobile wheel unit drive means;

i. means including said first connection means, said turbine shaft, and said second input shaft for connecting said fluid torque converter, said overdrive unit, and said multi-speed change gear unit, in series;

j. normally unactuated lock up clutch means connecting said engine input shaft directly to said turbine shaft for bypassing said fluid torque converter during overdrive operation; and

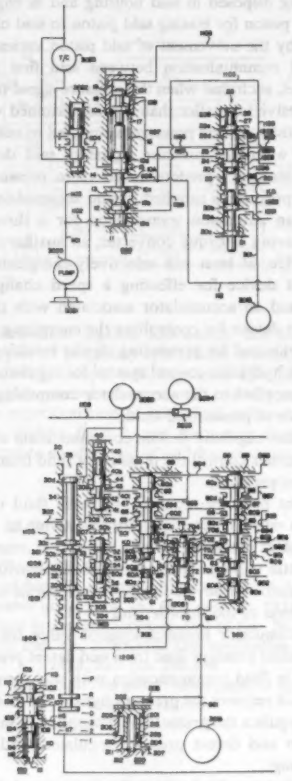
k. a one-way clutch means which is provided in association with said normal drive clutch means, and which during forward normal drive transmission by said combination carries a portion of torque load imposed in transmission of drive from said turbine shaft to said second input shaft.

4,056,991

HYDRAULIC CONTROL DEVICE FOR USE WITH AUTOMATIC SPEED CHANGE GEAR DEVICE

Toshimitsu Sakai; Kagenori Fukumura, and Tadashi Saito, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 10, 1975, Ser. No. 585,605
Claims priority, application Japan, Aug. 13, 1974, 49-92005
Int. Cl.[2] B60K *41/04, 41/10;* F16D *25/11;* F16K *31/363*
U.S. Cl. 74—863 6 Claims



1. In an automatic transmission for a throttle-controlled engine having a torque convertor, an auxiliary speed change gear device, at least one selectively-energizable friction engagement device for effecting a speed change in the gear device, and an accumulator associated with the friction engagement device for controlling the energizing of the engagement device and or preventing shocks resulting from a speed change, a hydraulic control system for regulating the pressure of fluid supplied to the accumulator comprising:

a source of pressurized fluid;

a pressure regulator in fluid communication with said source to further control the pressure of fluid from said source to a line pressure;

a throttle valve in fluid communication with said pressure regulator for developing a pressure signal indicative of the position of the throttle; and

an accumulator pressure control valve in fluid communication with said pressure regulator and said throttle valve, and responsive to the pressure signal from said throttle valve to regulate the pressure of fluid supplied to said accumulator from said regulator, said control valve having:

a housing provided with a first inlet coupled to said regula-

tor, an inlet coupled to said throttle valve, a fluid outlet coupled to said accumulator, and a fluid port in communication with said outlet and said first inlet;

a piston disposed within said housing and which requires the pressure signal from said throttle valve to move from a closed position, in which fluid communication is prevented between said first inlet and said outlet, to an open position, in which fluid communication is permitted between said first inlet and said outlet; and

a spring disposed in said housing and in engagement with said piston for biasing said piston to said closed position,

whereby the movement of said piston varies the degree of fluid communication between said first inlet and said outlet, such that when the pressure signal from said throttle valve is smaller than a predetermined value, pressure less than the line pressure is supplied to said accumulator, and when the pressure signal of said throttle valve is greater than a predetermined value, pressure equal to the line pressure is supplied to said accumulator.

6. In an automatic transmission for a throttle-controlled engine having a torque converter, an auxillary speed change gear device, at least one selectively-energizable friction engagement device for effecting a speed change in the gear device, and an accumulator associated with the friction engagement device for controlling the energizing of the engagement device and for preventing shocks resulting from a speed change, a hydraulic control system for regulating the pressure of fluid supplied to the accumulator comprising:

a source of pressurized fluid;

a pressure regulator in fluid communication with said source to further control the pressure of fluid from said source to a line pressure;

a detent pressure regulator valve in fluid communication with said pressure regulator to provide an output fluid of constant pressure;

a throttle valve in fluid communication with said pressure regulator for developing a pressure signal indicative of the position of the throttle; and

an accumulator pressure control valve for receiving the constant pressure fluid from said detent pressure regulator and in fluid communication with said throttle valve, and which requires the pressure signal from said throttle valve to regulate the pressure fluid supplied to said accumulator from said detent pressure regulator, said control valve having:

a housing provided with a first inlet coupled to said detent pressure regulator, an inlet coupled to said throttle valve a fluid outlet coupled to said accumulator, and a fluid port in communication with said outlet and said first inlet;

a piston disposed within said housing and consisting of a first and a second land of the same diameter, and a third land of a different diameter, said throttle valve inlet being open to said thir land, said first inlet being open to said first land, and the head of said first land is in communication with fluid supplied to said accumulator; and

a spring disposed within said housing between said third land and one end of said housing for biasing said piston to an open position,

said piston requiring the pressure signal from said throttle valve to vary the degree of fluid communication between said first inlet and said outlet, such that when the pressure signal from said throttle valve is smaller than a predetermined value, pressure less than the detent pressure is supplied to said accumulator, and when the pressure signal of said throttle valve is greater than a predetermined value, pressure equal to the detent regulator pressure is supplied to said accumulator.

4,056,992

SHEAR FOIL AND METHOD OF MAKING THE SAME

Friedrich Blume, Schwalbach, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 31, 1976, Ser. No. 719,143
Claims priority, application Germany, Sept. 11, 1975, 2540434
Int. Cl.[2] B21K *11/00*; B26B *19/04*
U.S. Cl. 76—104 R **13 Claims**

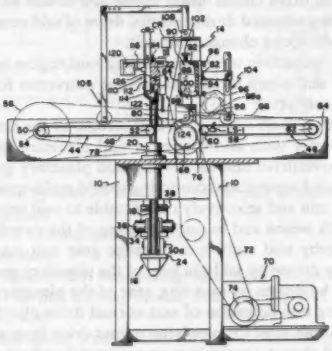
1. A method of making a shear foil, comprising the steps of providing a matrix element with a plurality of isles which are separated by a shallow grid-spaced recess and which have a matrix surface; overfilling said recess with a molding substance and forming a plurality of inserts each of which overlaps a narrow annular region of said matrix surface; depositing a layer of screen-forming substance over said inserts and forming a screen having a plurality of openings which extend to said matrix surface intermediate respectively adjacent inserts, said screen also having a face comprised of annular face portions each of which surrounds one of said inserts and is juxtaposed with said matrix surface; separating said matrix element and the isles from said screen and said insert and exposing said inserts and said face; depositing a layer of wear-resistant substance over said exposed face and inserts; and removing the portion of said wear-resistant layer deposited on said inserts, while leaving the remaining portion of said wear-resistant layer on said annular face portions, by separating said inserts from said screen.

4,056,993

SHEET SLITTER AND PUNCH ASSEMBLY

Henry J. Brettrager, 5450 East Street, Saginaw, Mich. 48601

Filed July 26, 1976, Ser. No. 708,835
Int. Cl.[2] B26D *9/00*, *11/00*
U.S. Cl. 83—82 **2 Claims**



1. Apparatus for longitudinally and transversely slitting a sheet of paperboard or like material to form a plurality of individual rectangular cards comprising feed means for feeding an elongate sheet of material in a direction at a first speed along a first upstream section and at a second speed higher than said first speed on a second downstream section, a plurality of transversely spaced first cutter means operatively associated with said feed means at a location between said first and second sections for cutting spaced parallel longitudinal slits through said sheet as said sheet is advanced by said feed means, transversely extending support means overlying said feed means between said first and second sections and supported for vertical movement between a normally maintained upper position and an actuated lower position, second cutter means mounted

on said support means for movement transversely of said feed means between a normally maintained first end limit at a side edge of a sheet on said feed means and an opposite end limit wherein said second cutter is located at the opposite side edge of a sheet in said feed means, said second cutter means being located clear of said sheet on said feed means when said support means is in said upper position and being located in cutting relationship with said sheet on said feed means when said support means is in said lower position, first reversible drive means for shifting said support means between upper and said lower position, second reversible drive means for driving said second cutter means between its first and second end limits of movement, and control means operable upon the advancement by said feed means of the leading end of the sheet to a preselected position on said feed means for sequentially:

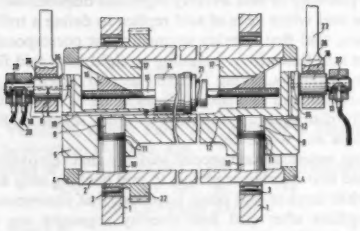
a. stopping said feed means,
b. actuating said first drive means to drive said support means to its lower position,
c. actuating said second drive means to drive said second cutter means from said first end limit to said second end limit to separate the leading end portion of said sheet from said sheet,
d. actuating said first drive means to raise said support means,
e. simultaneously starting said feed means to advance the separated leading end portion of said sheet along said second section away from the remainder of said sheet, and
f. actuating said second drive means to return said second cutter means to its first end limit.

4,056,994

FLYING SHEAR FOR THE CROSSCUTTING OF METAL STRIPS OR BANDS

Josef Ihle, Pforzheim, Germany, assignor to Irma Ungerer geb. Dollinger, Germany

Filed Sept. 21, 1976, Ser. No. 725,109
Claims priority, application Germany, Nov. 5, 1975, 2549481
Int. Cl.² B26D *1/56*
U.S. Cl. 83—311 **9 Claims**



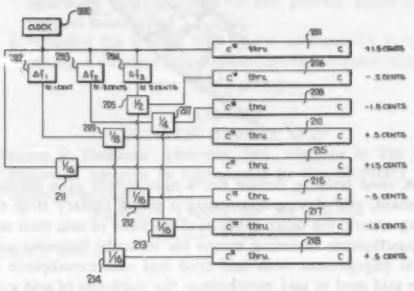
1. In a flying shear, designed as a crank rocker shear, for crosscutting metal strips continuously fed thereto, including a shear frame and a crank and a crank shaft rotatable in the shear frame and effecting entrainment of strip cutting knives in the direction of strip movement, and return of the cutting knives in the opposite direction, with the crank radius being adjustable in accordance with different cutting lengths of the strip, the improvement comprising, in combination, said crank shaft having an interior recess therein; a crank axle mounted in said recess and guided therein for adjustment rectilinearly of a diameter of said crank shaft; means connecting said crank axle to said strip cutting knives; and adjusting means operatively associated with said crank axle and operable to adjust said crank axle rectilinearly of said diameter of said crank shaft to adjust the crank radius, mounted in said interior recess and rotatable as a unit with said crank shaft.

4,056,995

SINGLE MASTER TONE GENERATOR

Dale M. Uetrecht, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Division of Ser. No. 449,990, March 11, 1974, which is a division of Ser. No. 147,976, May 28, 1971, Pat. No. 3,816,635. This application Mar. 31, 1975, Ser. No. 563,431
Int. Cl.² G10H *1/00*
U.S. Cl. 84—1.01 **2 Claims**



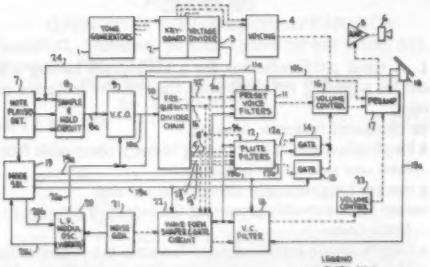
1. In an electronic musical instrument, the combination comprising a pair of frequency synthesizer, a source of clock pulses connected to one of said frequency synthesizers, and frequency divider means connected with said source for dividing the pulse repetition rate of said clock pulses by a factor which differs slightly from 2, said frequency divider means being connected to another one of said frequency synthesizers.

4,056,996

ELECTRONIC MUSIC SYSTEM

David A. Bunger, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Continuation of Ser. No. 452,045, March 18, 1974, abandoned, which is a division of Ser. No. 263,649, June 16, 1972, Pat. No. 3,801,721, which is a continuation-in-part of Ser. No. 213,939, Dec. 30, 1971, Pat. No. 3,789,718. This application June 23, 1975, Ser. No. 589,559
The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.
Int. Cl.² G10H *1/02, 5/10*
U.S. Cl. 84—1.19 **25 Claims**

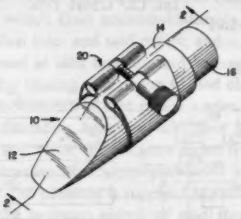


1. In an electronic organ, an improvement comprising:
means for generating a repetitive pulse tone signal;
a source of control voltage, the magnitude of said control voltage being dependent upon selected notes played on a keyboard of the organ;
means responsive to the magnitude of said control voltage for modulating the widths of said pulses as a function of said magnitude of said control voltage.

4,056,997
REED HOLDING DEVICE FOR MUSICAL INSTRUMENTS

Philip Lee Rovner, 6 Tentmill Lane-F, Baltimore, Md. 21208

Filed Dec. 23, 1976, Ser. No. 753,893
Int. Cl.[2] G10D 9/02
U.S. Cl. 84—383 R 19 Claims

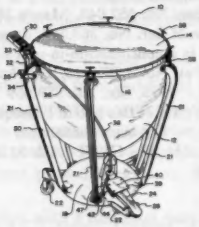


1. A reed holding device for a mouthpiece of a musical instrument, said device comprising a single unitary strip extending around the outer surfaces of portions of said reed and said mouthpiece, fastening means for securely fastening said strip in engagement with said reed and said mouthpiece to secure said reed to said mouthpiece, the thickness of said strip varying from a minimum thickness along the area of engagement with said reed, to a maximum thickness along an area of engagement with said mouthpiece to provide a graduated mechanical impedance to the energy from said reed during exitation.

4,056,998
TONAL PITCH INDICATOR FOR A KETTLEDRUM

Roger H. Rampton, 229 Mallard, Las Vegas, Nev. 89107

Filed May 24, 1976, Ser. No. 689,286
Int. Cl.[2] G10D 13/04
U.S. Cl. 84—419 12 Claims



1. A tonal pitch indicator for a kettledrum having a foot pedal for adjusting the tonal pitch thereof, the indicator comprising:

an elongated indicator housing;

a longitudinal slot in the housing visually observable from at least one side of the housing;

a marker longitudinally movable in the slot;

means for removably mounting the indicator housing to the kettledrum;

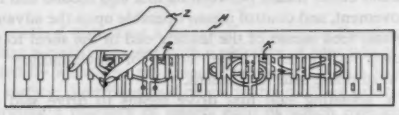
a hollow sheath interconnected between the indicator housing and the foot pedal means and having sufficient length to form an arcuate curvature between the indicator housing and the foot pedal means; and

a cable connected to the marker and passing through the hollow sheath to an anchoring means beyond the end of the hollow sheath, a portion of the cable adjacent the foot pedal means being encased in a stiffening tube having sufficient stiffness to accommodate movement of the foot pedal means relative to the cable to telescopically enclose the cable with the sheath thereby changing the curvature of the sheath resulting in a relative movement of the cable and sheath to cause the cable to move the marker in the slot.

4,056,999
PIANO TEACHING AID

William J. Bennett, 23403 South Berendo, Torrance, Calif. 90502

Filed Sept. 17, 1976, Ser. No. 724,301
Int. Cl.[2] G09B 15/02
U.S. Cl. 84—479 4 Claims



1. In combination with a piano that includes a keyboard defined by a plurality of side-by-side white keys and a plurality of black keys spaced in groups of two and three and a sheet of music that has a score thereon that includes an upper spaced group of parallel lines that are identified by a treble insignia and which lines and the spaces therebetween have a plurality of longitudinally spaced notes associated therewith; a lower spaced group of parallel lines that are identified by a bass insignia and which lines and the spaces therebetween have a plurality of longitudinally spaced notes associated therewith; and a single line that corresponds to middle C disposed between said upper and lower group of lines and separated therefrom by upper and lower spaces, said single line and upper and lower spaces having a plurality of spaced notes associated therewith, a device capable of being removably secured to said white keys to visually indicate to a user the white key that corresponds to a particular note on upper group of lines and said spaces therebetween, said lower group of lines and said spaces therebetween, and said single line and spaces above and below the latter, said device including:

a. an elongate backing strip on which a replica of at least the portion of the white and black keys of said keyboard are depicted that correspond to said notes on said score of said sheet of music;

b. a plurality of first overlay segments disposed side-by-side on said white keys of said replica to define a treble signature, said first overlay segments that correspond to lines on said first group including straight tabs, said first overlay segments having first and second oppositely disposed surfaces, and said first surfaces being of a color that visually distinguishes said first overlay segments from said black and white keys;

c. first means on said second surfaces that removably secure said first overlay segments to said backing strip and to the white keys of said piano keyboard that correspond to said replicas after said first overlay segments are removed from said backing strip;

d. a plurality of second overlay segments disposed side-by-side on said white keys of said replica that are of the same structure as said first overlay segments but are different in shape in that they define a bass signature, said second overlay segments being mounted on said backing sheet and secured to the corresponding white keys of said keyboard in the same manner as said first overlay segments;

e. a third overlay segment in the form of an elongate tab that is of the same structure as one of said first overlay segments that is removably mounted on middle C key of said replica and when removed therefrom is removably secured to middle key C of said keyboard, with said first, second and third replicas when mounted on said white keys of said keyboard visually indicating to a user the key that corresponds to a note on a line of said upper and lower groups of lines and the line therebetween, and notes in spaces in said upper and lower groups of lines and

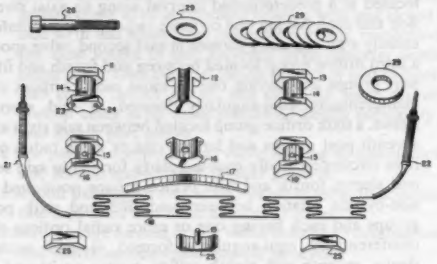
above and below the middle C line in said music being identified on said piano keyboard as a white key disposed between two of said tabs.

4,057,000

MECHANISM FOR DEEP OCEAN INSTRUMENTATION REMOTE RELEASE

Geoffrey Owen Thomas, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 20, 1976, Ser. No. 724,831
Int. Cl.[2] F16B *37/10*
U.S. Cl. 85—33 11 Claims



1. A simple, quiet, load-release device for use with a threaded bolt in securing a load comprising:

a threaded nut,

said nut machined circumferentially along a portion of its outer surface to have the shape of a bobbin and severed into three equal sections along its length;

a meltable tape for wrapping in layers around said nut sections when assembled into a whole and within the machined portion of said nut to prevent radial disassembly; and

an electrical resistance means for assembly between the layers of meltable tape,

whereby a suitable electrical current passed through said resistance means generates heat and melts said tape permitting the sections of said nut to separate and release the load.

4,057,001

ENDLESS CARRIER SLEEVE FOR DISCRETE FRAGMENTS

Jean A. Valentine, Winter Park, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Continuation of Ser. No. 718,983, April 1, 1968. This application Oct. 31, 1969, Ser. No. 871,714
Int. Cl.[2] F42B *33/00*
U.S. Cl. 86—1 R 5 Claims

1. A method of constructing a fragment shell of the type used in an explosive device, said method comprising:

a. continuously forming an elongated flexible tube;

b. individually feeding a plurality of discrete fragments to said tube at a predetermined variable rate;

c. positioning said discrete fragments within said tube in a predetermined spaced relation to one another, whereby fragment density within a predetermined portion of said tube may be regulated by the rate of feed of said fragments to said tube;

d. wrapping the formed fragment containing tube about support means so as to arrange said tube into a shell configuration corresponding to the general shape of said support means; and

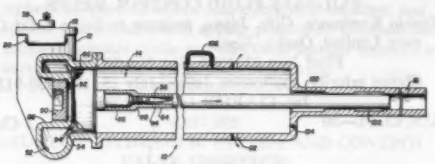
e. securing the wound tube into a substantially rigid shell having a configuration defined by said support means.

4,057,002

KINETIC BARREL GUN

William F. Donovan, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 7, 1976, Ser. No. 674,469
Int. Cl.[2] F41F *1/00*
U.S. Cl. 89—8 11 Claims



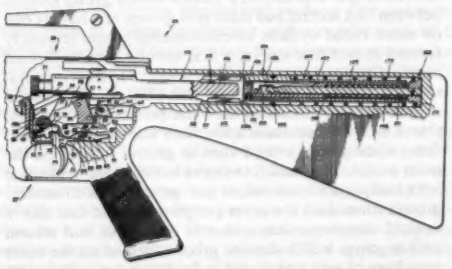
1. A gun for firing a projectile therefrom whereby the acceleration of the projectile is increased within the gun comprising: a tube having a primary combustion chamber and a piston-barrel chamber, said combustion chamber containing first charge means which includes an igniter means and a charge eccentrically mounted relative to the longitudinal axis of the tube to produce a stream of gas from said charge to said piston-barrel chamber and a gas pressure increasing means interposed between said charge and said chamber; said piston-barrel chamber having a piston therein accelerated by said gas from said charge means; said piston having means for retaining a projectile and second charge means for accelerating said projectile relative to said piston; and a firing means activated by said first charge means for igniting said second charge means.

4,057,003

OPEN BOLT CONVERSION APPARATUS

Maxwell G. Atchisson, 55 Old Yellow Springs Road, Apt. H, Fairborn, Ohio 45324

Filed Dec. 30, 1975, Ser. No. 645,362
Int. Cl.[2] F41D *5/04, 11/02*
U.S. Cl. 89—138 6 Claims



1. Open bolt firing mechanism for a firearm of the type including a receiver housing having a reciprocating bolt mech-

anism and a hammer-operated firing pin carried by said bolt mechanism; comprising:

sear means pivotally mounted within said receiver section;

said sear means having a bolt engaging surface to engage and retain said bolt mechanism in open position, and a second surface which engages said receiver housing in force transmitting alignment with said bolt engaging surface, so that forward force of said open bolt mechanism is transferred through said sear means to said receiver housing;

trigger means engagable with said sear means to pivotally move said sear means so that said bolt engaging surface is withdrawn from said bolt mechanism; and

hammer means mounted for pivotal motion concentrically with and independently of pivotal motion of said sear means;

said hammer means having a pair of legs which extend alongside of said sear means, and a bridge portion which extends between said legs outwardly beyond said sear means, so that said hammer means can pivot without interference with said sear means to bring said bridge portion into firing contact with said firing pin when said bolt assembly has moved forward.

4,057,004

FAIL-SAFE FLUID CONTROL VALVE

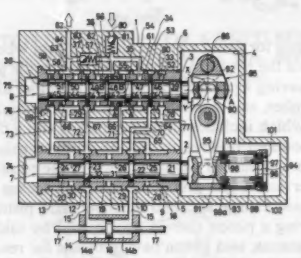
Toshio Kamimura, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed July 22, 1976, Ser. No. 707,762

Claims priority, application Japan, July 25, 1975, 50-91320

Int. Cl.² F15B *13/04, 20/00*

U.S. Cl. 91—30 **3 Claims**



1. A fail-safe fluid control valve comprising:

a valve housing having first and second concave portions formed therein parallel relation with each other,

a first sleeve positioned within and fixed to said first concave portion of said valve housing, said first sleeve including first, second and third port groups located at a predetermined interval along its axial direction and each having one or more radial ports circumferentially equi-angularly formed in said first sleeve, a first orifice group located between said first and second port groups and having one or more radial orifices circumferentially equi-angularly formed in said first sleeve, a second orifice group located between said second and third port groups and having one or more radial orifices circumferentially equi-angularly formed in said first sleeve, a first annular groove formed on the outer periphery of said first sleeve in fluid communication with said ports of said first port group, a second annular groove formed on the outer periphery of said first sleeve in fluid communication with said orifices of said first orifice group, a third annular groove formed on the outer periphery of said first sleeve in fluid communication with said ports of said second port group, a fourth annular groove formed on the outer periphery of said first sleeve in fluid communication with said orifices of said second orifice group, a fifth annular groove formed on the outer periphery of said first sleeve in fluid communication with said ports of said third port group;

a first valve spool reciprocably accommodated in said first sleeve and having first, second, third and fourth large diameter portions integrally formed on the outer periphery of said first valve spool, the interval between said second and third large diameter portions being substantially equal to the interval between said first and second orifice groups, the axial length of each of said second and third large diameter portions being substantially equal to the axial length of each of said orifices of said first and second orifice groups, and said first and fourth large diameter portions being located at all times axially outwardly of said first and third port groups;

a second sleeve positioned within and fixed to said second concave portion of said valve housing, said second sleeve including fourth, fifth, sixth and seventh port groups located at a predetermined interval along its axial direction and each having one or more radial ports circumferentially equi-angularly formed in said second valve spool, a third orifice group located between said fourth and fifth port groups and having one or more radial orifices circumferentially equi-angularly formed in said second sleeve, a sixth orifice group located between said sixth and seventh port groups and having one or more radial orifices circumferentially equi-angularly formed in said second sleeve, fourth and fifth orifice groups positioned in side-by-side relation between said fifth and sixth port groups and each having one or more radial orifices circumferentially equi-angularly formed in said second sleeve, seventh and eighth orifice groups positioned in side-by-side relation axially outwardly of said seventh port group and each having one or more radial orifices circumferentially equi-angularly formed in said second sleeve, a sixth annular groove formed on the outer periphery of said second sleeve in fluidal communication with said ports of said fourth port group, a seventh annular groove formed on the outer periphery of said second sleeve in fluidal communication with said orifices of said third orifice group, and eighth annular groove formed on the outer periphery of said second sleeve in fluidal communication with said ports of said fifth port group, a ninth annular groove formed on the outer periphery of said second sleeve in fluidal communication with said orifices of said fourth orifice group, an eleventh annular groove formed on the outer periphery of said second sleeve in fluidal communication with said orifices of said sixth orifice group, a thirteenth annular groove formed on the outer periphery of said second sleeve in fluidal communication with said orifices of said eighth orifice group, a tenth annular groove formed on the outer periphery of said second sleeve in fluidal communication with said orifices of said fifth orifice group and said ports of said sixth port group, and a twelveth annular groove formed on the outer periphery of said second sleeve in fluidal communication with said ports of said seventh port group and said orifices of said seventh orifice group;

a second valve spool reciprocably accommodated in said second sleeve and having fifth, sixth, seventh, eighth, ninth, tenth and eleventh large diameter portions, the interval between said sixth and ninth large diameter being substantially equal to the interval between said third and sixth orifice groups, the axial length of each of said sixth and ninth large diameter portions being substantially equal to the axial length of each of said orifices of said third and sixth orifice groups, the end face of said eighth large diameter portion facing said seventh large diameter portion being brought into substantial alignment with the inner face of each of said orifices of said fifth orifice group adjacent to said sixth port group and the end face of said tenth large diameter portion facing said eleventh large diameter portion being brought into substantial alignment with the inner face of each of said orifices of said seventh orifice group adjacent to said seventh port group when said orifices of said third and sixth orifice groups come to be in opposing relation with and closed by said sixth and

ninth large diameter portions, respectively, the end face of said seventh large diameter portion facing said eighth large diameter portion being brought into substantial alignment with the inner face of each of said orifices of said fourth orifice group adjacent to said fifth port group when said orifices of said third and sixth orifice groups come to be in opposing relation with and closed by said sixth and ninth large diameter portions, respectively, the axial length of said seventh large diameter portion being substantially equal to the axial length of each of said orifices of said fourth orifice group, the end face of said eleventh diameter portion facing said tenth large diameter portion being brought into substantial alignment with the axially outermost inner face of each of said eighth orifice group when said orifices of said third and sixth orifice groups come to be in opposing relation with and closed by said sixth and ninth large diameter portions, respectively, the axial length of said eleventh large diameter portion being larger than the axial length of each of said orifices of said eighth orifice group, and said fifth large diameter portion being at all times positioned axially outwardly of said fourth port group,

a first passage formed in said valve housing to communicate said second and seventh annular grooves;

a second passage formed in said valve housing to communicate said third and ninth annular grooves;

a third passage formed in said valve housing to communicate said fourth and eleventh annular grooves;

a fourth passage formed in said valve housing to communicate said first, fifth and thirteenth annular grooves;

a fifth passage formed in said valve housing to communicate said sixth and twelveth annular grooves;

a valve cylinder having a pair of cylinder conduits communicated with said second and fourth annular grooves, respectively;

an inlet conduit communicated with said eighth and tenth annular grooves;

an outlet conduit communicated with said twelveth annular groove; and

a reciprocating input mechanism disposed in the vicinity of and operably connected to said first and second valve spools so that only said first valve spool is reciprocated with said second valve spool held stationary to reciprocate any one of said valve housing and a piston rod of said valve cylinder in a normal condition while said second valve spool is reciprocated for imparting a reciprocating motion to any one of said valve housing and said piston rod of said valve cylinder in an abnormal condition where said first valve spool is stuck to said first sleeve to prevent said first valve spool from being reciprocated in said first sleeve.

2. A fail-safe fluid control valve comprising: a valve housing having first and second concave portions formed therein in parallel relation with each other, a first sleeve positioned within and fixed to said first concave portion of said valve housing, a second sleeve positioned within and fixed to said second concave portion of said valve housing, a first valve spool reciprocably accommodated in said first sleeve, a second valve spool reciprocably accommodated in said second sleeve, a valve cylinder operatively connected to said valve housing and having a reciprocable piston rod, whereby said first valve spool is reciprocated in said first sleeve for reciprocation motion of any one of said valve housing and said piston rod of said valve cylinder in a normal condition while said second valve spool is reciprocated in said second sleeve for reciprocation motion of any one of said valve housing and said piston rod of said valve cylinder in an abnormal condition where said first valve spool is stuck to said first sleeve and thus unable to be reciprocated in said first sleeve; the improvement comprising in combination:

a first lever provided adjacent the end portions of said first and second valve spools;

a second lever having an upper end pivotally connected to the end portion of said second valve spool and a lower end pivotally connected to the end portion of said first valve spool;

a rockable rod provided adjacent said second valve spool and securely connected to said first lever in perpendicular relation with said first lever and said second valve spool for imparting a rocking motion to said first lever;

a pivotal pin pivotally connecting the intermediate portion of said first and second levers for allowing said first and second lever to be pivotable;

a projection integrally connected to the end of said first valve spool through an annular ledge interposed therebetween and extending in axial alignment with said first valve spool;

a movable annular collar axially slidably retained on said projection;

a fixed annular collar securely retained on the free end of said projection;

a first compression coil spring positioned between said movable annular collar and said fixed annular collar to surround said projection;

a cylindrical member pivotally connected to the lower end of said first lever and retained in slidable relation with the first valve spool to surround said projection;

a fixed annular member securely retained on the inner periphery of the free end of said cylindrical member; and

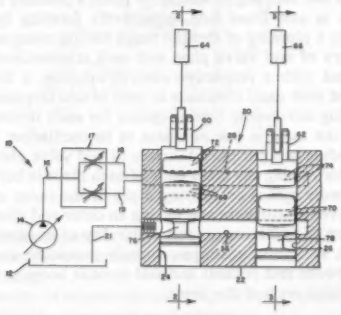
a second compression coil spring positioned between said movable annular collar and said fixed annular member to surround said first compression coil spring.

4,057,005

DUAL FLOW HYDRAULIC SYSTEM AND CONTROL VALVE THEREFOR

Curtis Phillip Ring, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sept. 12, 1975, Ser. No. 612,631
Int. Cl.[2] F15B *11/16*
U.S. Cl. 91—413 **6 Claims**



1. A valve comprising: a valve body having a plurality of bores provided therein; parallel and coplanar first and second input passage means intersecting and straddling all of the bores; a plurality of coplanar first function passage means each intersecting one of the bores adjacent and perpendicular to the first and second input passage means; a plurality of coplanar second function passage means each intersecting one of the bores and colinear with the first function means; exhaust passage means intersecting all the bores adjacent and perpendicular to the first and second function port means; and a plurality of spool means each received within and independently axially slidable in each of the bores between a first and second position; each of said spool means containing a pair of opposed notches therein; a first and a second of said opposed notches respectively connecting the first and second input passage means to the first and second function passage means when said spool means is in the first position and respectively con-

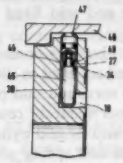
necting the first and second function passage means to the exhaust passage means when said spool means is in the second position.

4,057,006

VALVE PLATE ARRANGEMENT FOR HYDROSTATIC PISTON MACHINES

Hans Warnke, Herne, and Werner Böer, Castrop-Rauxel, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Mar. 29, 1976, Ser. No. 671,611
Claims priority, application Germany, May 9, 1975, 2520695
Int. Cl.² F01B *3/00, 13/04*
U.S. Cl. 91—487 7 Claims



1. In an axial piston machine of the swash plate type, a combination comprising a valve plate having a front face and a rear face, a pair of control openings in said front face and each having opposite ends; a plurality of bores providing communication between said opposite ends of said control openings and said rear face of said valve plate; a plurality of shallow pockets in said front face respectively forming hydrostatic bearings; a plurality of throttle bores having outer ends at the periphery of said valve plate and each communicating at an inner end with a respective control opening; a throttle pin arranged with small clearance in each of said throttle bores for oscillating movement; biasing means for each throttle pin for biasing the same in one direction of its oscillation; a housing surrounding said peripheral surface of said valve plate; closure means for closing the outer ends of each throttle bore, each of said closure means comprising a pin in the outer end of the respective throttle bore and having an outer end abutting onto a portion of said housing; and a plurality of connecting bores through said valve plate respectively providing communication between said pockets and said throttle bores in the region of the outer ends of the latter.

4,057,007

ROTARY FLUID DEVICE HAVING TWO ROTOR SECTIONS

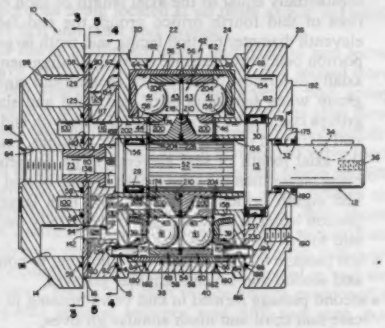
James M. Denker, Scituate, Mass., assignor to Nutron Corporation, Hingham, Mass.

Filed Mar. 24, 1976, Ser. No. 669,881
Int. Cl.² F01B *3/04;* F16H *53/00*
U.S. Cl. 91—501 23 Claims

1. In a rotary fluid device of the type including a shaft, a cam defining an undulating cam surface, a rotor mounted coaxially of the shaft and defining a porting surface, a plurality of pistons engaging the cam carried by the rotor for movement relative thereto, a porting member defining an annular porting surface engaging the rotor porting surface, and a plurality of bores defined by said rotor and each carrying at least one of said pistons, that improvement wherein:

said rotor comprises two rotor sections mounted coaxially on the shaft for limited axial movement relative to each other and spaced slightly axially from each other, each of said rotor sections defining a generally axially-facing surface closely adjacent and facing towards the corresponding surface of the other of said rotor sections;

each of said bores includes a first bore portion defined by one of said rotor sections, a second bore portion defined by the other of said rotor sections, and an intermediate portion extending between said rotor sections;



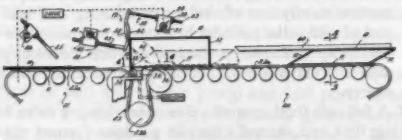
an annular sealing member extends between said axially-facing surfaces of said rotor sections generally coaxially therewith and seals said axially-facing surfaces to each other, the effective sealing diameter of said sealing member being not greater than the inner diameter of said annular porting surface defined by said porting member.

4,057,008

CARTON ERECTING APPARATUS

Charles C. Hughes, Ludlow, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Sept. 16, 1976, Ser. No. 723,992
Int. Cl.² B31B *1/52*
U.S. Cl. 93—53 BF 9 Claims



1. Apparatus for opening tubular carton blanks passing through said apparatus for movement toward a transport conveyor, said carton having a top panel, an upwardly-facing leading side panel, a bottom panel and a downwardly-facing trailing side panel all interconnected by creases, comprising:

an endless conveyor having an upstream section and a downstream section;

a transverse breaker bar located between said two sections;

a plurality of transversely spaced suction cups located downstream of said breaker bar;

a transverse shaft overlying said upstream section adjacent said breaker bar and having a radially projecting opening element engageable with said trailing side panel;

a transverse shaft overlying said downstream section and having a radially projecting overbreak element;

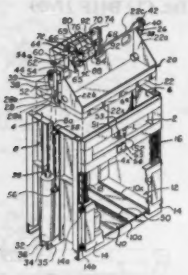
and means for rotating said shafts in timed relation to first swing a trailing side panel upwardly with said opening element and then swing said trailing side panel fowardly and downwardly with said overbreak element.

4,057,009

DOWNSTROKE BALER

Charles E. Burford, and Joe E. West, both of Dallas, Tex., assignors to Burford Corporation, Dallas, Tex.

Filed Aug. 19, 1975, Ser. No. 605,944
Int. Cl.² B30B *15/24*
U.S. Cl. 100—46 7 Claims



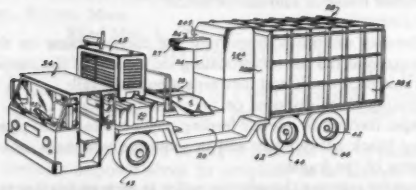
1. Bale forming apparatus comprising: a general frame; a compaction chamber in said general frame, said compaction chamber having a central axis; a platen in said compaction chamber; a pair of pressure actuated cylinders, each of said cylinders having a piston slideably disposed therein and a rod secured to the piston, said rod extending through a rod end of said cylinder, said piston being moveable between the rod end and a base end of said cylinder; means securing a base end of each of said cylinders to said frame adjacent opposite sides of said compaction chamber; means securing said rods to opposite ends of said platen; a source of pressurized fluid; first valve means between said source of pressurized fluid and a first of said cylinders; second valve means between said source of pressurized fluid and said second cylinder; an elongated sleeve; means securing said sleeve to said platen, said sleeve having a central axis which is parallel to the central axis of the chamber when said platen is in a horizontal attitude normal to the central axis of the chamber; an actuating rod extending through said sleeve; means restraining said actuating rod against movement in a direction parallel to the axis of the sleeve; and actuating means between said actuating rod and said first valve means, said actuating means being adapted to actuate said first valve means upon deviation of said platen from an attitude normal to said central axis of the compaction chamber.

4,057,010

VEHICLE MOUNTED COMPACTOR APPARATUS

Gary D. Smith, Waco, Tex., assignor to Mobile Auto Crushers Corporation of America, Dallas, Tex.

Continuation of Ser. No. 479,721, June 17, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,525
Int. Cl.² B30B *15/16*
U.S. Cl. 100—50 14 Claims



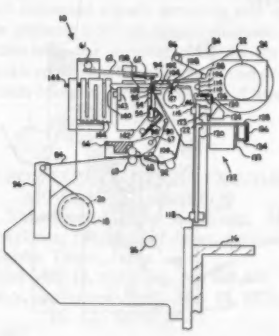
1. Bale forming apparatus comprising: support means; a compaction chamber having an inlet passage and an outlet passage; means to secure said chamber to said support means; closure means adjacent said outlet passage; means to move said closure means between a first position across said outlet passage and a second position spaced from said outlet passage; a ram movable through said chamber between said inlet passage and said outlet passage; a plurality of cylinders, each of said cylinders having a piston movable therethrough and a rod secured to the piston, said rod extending through an end of each cylinder; a common head securing each of said cylinders to said support means; means securing each of said rods to said ram; means to selectively direct pressurized incompressible fluid to opposite ends of a first of said plurality of cylinders to move said ram toward said outlet or toward said inlet; means to direct pressurized fluid to a second to said plurality of cylinders to move said ram toward said outlet when force exceeding a predetermined magnitude restrains movement of said ram toward said outlet passage by said first cylinder; a source of incompressible liquid; and means connecting said source of incompressible liquid to opposite ends of said second plurality of cylinders such that said second plurality of cylinders remain full of incompressible liquid as said pistons move through each of said cylinders.

4,057,011

MEANS FOR PRINTING OCR AND BAR CODE ON CARDS

Herbert Tramposch, Riverside, Conn., and Michael Polad, Mendota, Minn., assignors to Malco Plastics, Garrison, Md.

Continuation of Ser. No. 520,679, Nov. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 456,643, April 1, 1974, abandoned. This application Mar. 2, 1976, Ser. No. 663,178
Int. Cl.² B41J *1/10*
U.S. Cl. 101—93.03 4 Claims



1. A printing apparatus for printing bar codes, OCR and the like on cards, the combination comprising:

A. a housing;

B. a plurality of selectively and independently operable print bars slidably supported by the housing;

C. a plurality of interposers, one of said interposers being operatively engagable with each print bar;

D. a bail shaft;

E. drive means for imparting continuous oscillating rotary motion to the bail shaft;

F. a plurality of pressure bars supported by said housing,

1. one pressure bar being spaced relative to each print bar,

2. each said pressure bar having a stop projection thereon, and

3. said pressure bars being movable in a direction substantially parallel to the sliding movement of said print bars;

G. stop means on said housing for engaging said stop projection to limit the movement of the pressure bars in the direction toward the printing bars;

H. one of the plurality of print bars and plurality of pressure bars carrying particular font characters;

I. a plurality of springs, one each of said springs independently urging each pressure bar toward its associated print

bar, and said stop projection into contact with said stop means;

J. means for individually adjusting the pressure exerted and appropriately to the respective font character by each of said springs upon said pressure bars;

K. means for positioning a printing medium between the print bars and the pressure bars;

L. means for placing the card between the printing bars and the pressure bars; and

M. means for selectively operatively engaging an interposer with the bail shaft to selectively transmit the continuous motion of the bail shaft into a motion of a print bar toward and away from its associated pressure bar for printing engagement to move the pressure bar off its stop against said appropriate spring pressure for the font character to be printed.

4,057,012

PRINTING PRESS CONVERTIBLE FROM INTAGLIO TO FLEXOGRAPHIC PRINTING AND VICE VERSA

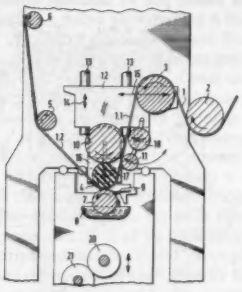
Rolf Heidemann, Ibbenburen, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

Filed Mar. 9, 1977, Ser. No. 775,953

Claims priority, application Germany, Mar. 10, 1976, 2610028

Int. Cl.[2] B41F *9/00, 11/00*

U.S. Cl. 101—153 **6 Claims**



1. A web printing press convertible from intaglio to flexographic printing and vice versa, comprising a frame; means for selectively mounting a flexographic printing cylinder and an intaglio printing cylinder within said frame; two impression cylinders; means for mounting said impression cylinders in displaceable and securable mountings on said frame; said impression cylinders including a rubber cylinder and a steel cylinder for selective cooperation with said intaglio printing cylinder and said flexographic printing cylinder, respectively; guide rollers disposed above said impression cylinders for guiding the web to be printed through upstream and downstream paths relative to the printing nip; said mounting means including means for mounting said steel cylinder in a displaceable carriage and further including means for mounting said rubber cylinder on pivotable arms for swinging said rubber cylinder about a pivotal axis from a position between said steel cylinder and said intaglio printing cylinder to a position above said steel cylinder and between said upstream and downstream web paths; means for mounting one of said web guide rollers for displacement from a vertical position above the said steel cylinder during flexographic printing to a position offset therefrom during intaglio printing.

4,057,013

ROLLING PRINTING MACHINE

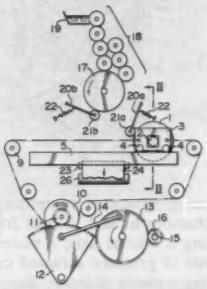
Shinzo Asano, Tokyo, Japan, assignor to Fuji Shiko Kabushiki Kaisha and Kabushiki Kaisha Asano Tekkosho, both of Tokyo, Japan

Continuation-in-part of Ser. No. 612,022, Sept. 10, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,234

Claims priority, application Japan, May 21, 1975, 50-60441

Int. Cl.[2] B41F *17/00*

U.S. Cl. 101—212 **1 Claim**



1. A printing press, comprising:

a plurality of ink feed rollers;

an ink reservoir disposed above said ink and in communication with feed rollers;

two inking rollers disposed below and in communication with said ink feed rollers, and arranged to rotate in opposite directions;

a plurality of ink application rollers, including at least one respective ink application roller for each of said two inking rollers, each arranged to rotate in a respective single direction then engaging the respective of said inking rollers;

a plurality of swing arms respective ones of said swing arms being connected at respective one ends thereof to said ink application rollers mounting the respective ink application rollers for displacement into communication with said ink feed rollers;

a plurality of tension springs attached to the respective opposite ends of said spring arm;

a printing roller disposed horizontally beneath said ink application rollers, and having a centre shaft;

a carrier frame;

means defining a centre notch in said carrier frame;

said printing roller centre shaft being supported by said carrier frame in said centre notch;

a horizontal rail;

a plurality of rollers supporting the carrier frame on the horizontal rail for reciprocating movement of the carrier frame backwards and forwards along said rail;

a printing block disposed on the printing roller;

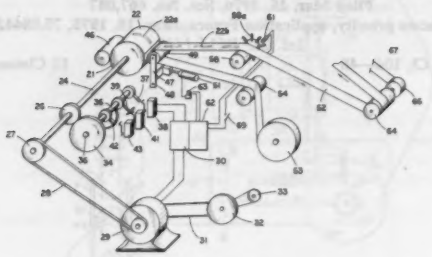
a paper feeding device for feeding paper beneath said printing block periodically and in sequence with said movement of the frame;

means for rotating the printing roller at such an angular rate as will give the printing block the same peripheral speed as the speed of reciprocating movement of said frame and including drive means including a crank means coupled with a gear sector linked to said swing arms for providing said displacement of said ink application rollers.

4,057,014
TAPE PRINTER AND STRIPPER ASSEMBLY

Charles S. Thomas, 1031 N. Brandon Ave., Marion, Ind. 46952

Filed Apr. 8, 1976, Ser. No. 674,858
Int. Cl.[2] B41F *13/02*
U.S. Cl. 101—228 4 Claims



1. An assembly for placing series of imprints on a continuous web of material by passing it between a rotating printing plate cylinder and an impression cylinder, with the space between each series of imprints on the strip differing from the space between each imprint within a series, said assembly comprising said plate cylinder carrying a plurality of printing plates in spaced relation around its circumference, drive means for rotating said plate cylinder at uniform speed, control means for halting said plate cylinder for a predetermined time period each time said plate cylinder has moved through a predetermined number of complete revolutions and said impression cylinder is opposite a void between the spaced printing plates, said control means including a control shaft driven by said plate cylinder drive means at a rotational speed which is the $1/n$ fraction of the rotational speed of said plate cylinder where n is the number of printing plates carried on the circumference of said plate cylinder, an element carried by said control shaft adapted to provide an electrical signal upon each complete revolution of the control shaft, and timing means actuated by said electrical signal for halting said drive means for a predetermined time upon occurrence of said electrical signal, and means for continuously pulling the web between the plate cylinder and the impression cylinder at a speed equal to the surface speed of the rotating printing plate cylinder, whereby with the plate cylinder halted the web moves relative to the plate cylinder only when said impression roller registers with a void between said spaced printing plates, the time interval in which said relative movement occurs defining the length of the space between series of imprints, and the number of imprints in each series being the product of the number of complete revolutions of said plate cylinder between said halted intervals and the number of spaced printing plates carried on said plate cylinder.

4,057,015
BAR CODE PRINTING SYSTEM

Robert D. Kodis, Brookline, Mass., assignor to Di/An Controls, Inc., Boston, Mass.

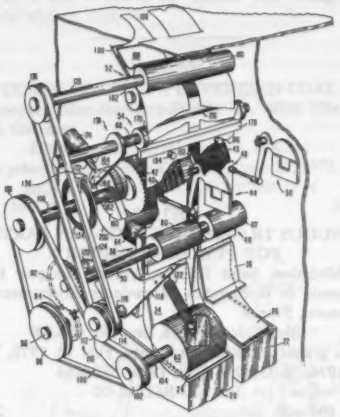
Filed Mar. 4, 1976, Ser. No. 663,905
Int. Cl.[2] B41J *1/60;* B41F *31/00*
U.S. Cl. 101—93.29 11 Claims

1. A system for printing bars on a web in response to coded data signals representing bar code messages, said system comprising:

a. a rotatable print drum having at least one row of printing elements disposed about its periphery in an arcuate column, said column of printing elements including at least a pair of matching bar printing elements that are spaced from one another, each said printing element having a unique address defining a unique angular position on said drum;

b. an impactor assembly associated with said print drum for pressing a web passing between said drum and said impactor assembly against selected ones of said bar printing elements for printing bars on the web, one row of bars printed during one revolution of said drum; and

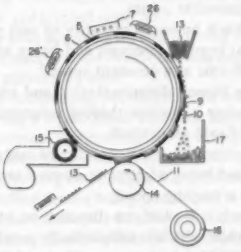
c. a processor for receiving a code data signal requesting the printing of one of said bars on the web, said processor converting said coded signal into command signals alternatively defining the address locations of said matching bar printing elements for successive rotations of said drum, said command signals actuating said impactor assembly for pressing said web against alternate ones of said pair of matching bar printing elements for successive coded signals requesting the printing of said one bar on the web for each complete revolution of said drum.



4,057,016
PROCESS FOR ELECTROSTATIC PRINTING AND APPARATUS THEREFOR

Ichiro Endo, Yokohama; Hajime Kobayashi, Mitaka, and Nobuhiro Takekawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1976, Ser. No. 685,460
Claims priority, application Japan, May 19, 1975, 50-59389
Int. Cl.[2] G03G *5/026*
U.S. Cl. 101—465 89 Claims



1. In an electrostatic printing process which includes the steps of forming an electrostatic latent image on a smooth-surfaced electrostatic printing master, stable towards exposure to light or maintenance in the dark, having a layer which comprises an insulating medium having an electric resistance sufficient to retain an electrostatic charge and a conductive silver image in said insulating medium, developing said latent image to form a visible image, and transferring the developed visible image onto a support therefor, the improvement comprising

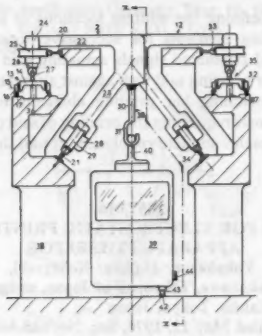
enhancing the electrical conductivity of said silver image by heating said master at least once during said printing process sufficient to reduce the tendency of said developer to adhere thereto and create undesired fog, whereby said enhanced conductivity is imparted to said silver image portion through at least about 10 cycles of printing.

4,057,017

CONTINUOUS TRANSPORT SYSTEM, IN PARTICULAR FOR PUBLIC TRANSPORT

Daniel Michalon, Saint Etienne, France, assignor to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement, France

Filed Feb. 13, 1976, Ser. No. 658,009
Claims priority, application France, Feb. 13, 1975, 75.05206; Feb. 3, 1976, 76.03543; Feb. 3, 1976, 76.03544
Int. Cl.[2] B61K *1/00*
U.S. Cl. 104—20 **27 Claims**



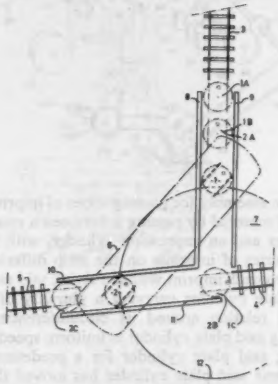
1. A continuous transport system comprising:
at least one main looped track;
a plurality of vehicles, each said vehicle including a platform and a removable cabin;
said main track having a plurality of said platforms secured thereto at regular intervals and being adapted to convey said platforms at a constant speed;
at least one looped disembarkation and embarkation station track having a portion thereof substantially parallel to a section of said main track;
said station track having a plurality of said platforms secured thereto and being adapted to convey said platforms therealong at a varying speed;
wherein each said platform disposed on said portion of said station track which is substantially parallel to said section of said main track is conveyed in a side-by-side horizontal projection relationship and at an equal speed with respect to a corresponding platform disposed on said section of said main track;
each of said removable cabins being adapted to be transferred between a platform disposed on said portion of said station track and a corresponding platform disposed on said section of said main track; and
wherein said station track is adapted to never intercept in the same plane with said main track.

4,057,018

TRANSFER SYSTEM FOR LONG VEHICLES SUCH AS WAGONS

Jacky Adrien Paul Laurent, Douai, and Francis Jean-Marie Croix-Marie, Viry Chatillon, both of France, assignors to Bertin & Cie, Plaisir and Arbel Industrie, Douai, both of, France

Filed Mar. 15, 1976, Ser. No. 667,087
Claims priority, application France, Mar. 18, 1975, 75.08442
Int. Cl.[2] B61J *1/10*
U.S. Cl. 104—48 **11 Claims**



7. On the ground surface of a marshalling yard at which a number of vehicle tracks end, a vehicle handling complex designed for marshalling a relatively long wheelbase vehicle having a front wheel unit and a rear wheel unit, comprising two separate and distinct, relatively short, ground-effect platforms commensurate with but a vehicle wheel unit, each of said two ground-effect platforms comprising:
an open-ended track section having a limited length which is but a small fraction of the vehicle wheelbase and being designed to mate with any of said tracks when the respective platform is positioned adjacent the same, said limited length track section being adapted to accommodate either one of said wheel units,
alignment means for aligning said track section with the end of any of said tracks, to maintain said track section in register with said track end, and
means for securing to said platform a vehicle portion thereon.

4,057,019

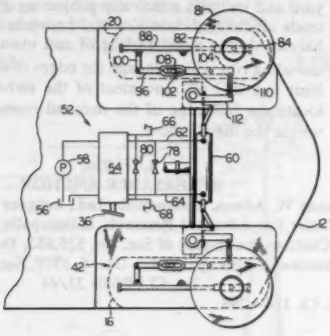
SELF-CONTAINED STEERING GUIDANCE MEANS

Walter M. Shaffer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 19, 1976, Ser. No. 650,085
Int. Cl.[2] B61F *9/00*
U.S. Cl. 104—247 **10 Claims**

1. In a vehicle defining a longitudinal axis and a lateral direction perpendicular thereto, a steering mechanism for a pair of transversely aligned vehicle-supporting wheels turnable about substantially vertical axes linked together for movement by hydraulic power means, said mechanism including:
at least one steering guidance member positioned to contact the guide surface laterally adjacent the vehicle, said at least one steering guidance member mounted on said vehicle for movement relative thereto;
linkage means including lost-motion means, having a resilient member and including an elongated slot connecting said at least one steering guidance member with said wheels to cause said wheels to move about a generally vertical axis upon relative lateral movement between said

at least one steering guidance member and said vehicle; and



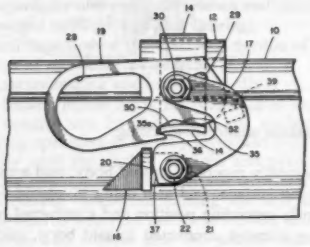
means for selectively rendering said hydraulic power means inoperative whereby turning of said wheels is accomplished by at least one steering guidance member through said linkage means.

4,057,020

CAM OPERATED HATCH COVER HOLDDOWN

William R. Halliar, Whiting, and Marvin Stark, Michigan City, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Feb. 26, 1976, Ser. No. 662,192
Int. Cl.² B61D *39/00*; B65D *45/20*
U.S. Cl. 105—377 **6 Claims**



1. For a hopper car hatch structure including a roof having a coaming defining a hatch opening, a hatch cover hingedly connected to said roof for movement between open and closed positions relative to said opening, and a hold down means supported on said roof including portions engaging said hatch cover in said closed position, said hold down means having a locking portion projecting horizontally outward relative to said coaming in the closed position of said hatch, a hatch cover latching mechanism, comprising:

an upstanding pedestal supported from the roof of the car substantially beneath the locking portion;

an upstanding linkage having upper and lower end portions, said lower end portion being pivotally coupled to said pedestal;

a rearwardly extendable vertical locking handle including a forward end portion, means coupling said handle at said forward end portion to said upper end portion of said linkage for pivotal and diagonal upward sliding movement relative to said linkage, said handle including a forward bottom portion having a downwardly convex camming surface engageable with the locking portion and a forwardly extending lip defining a horizontal notch spaced rearward and below said camming surface for receiving an edge of said locking portion;

said means coupling the handle to the upper portion of the linkage comprising,

a transverse forwardly upward elongated aperture in said forward portion of the handle;

said upper portion of the linkage having a transverse attachment aperture; and

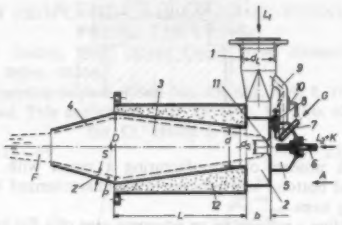
an upper pivot pin cooperatively extending through said apertures and coupling the handle and linkage in said pivotal sliding relation.

4,057,021

COMBUSTION OF PULVERIZED COAL

Fritz Schoppe, Max-Ruttgers-Strasse 24, 8026 Ebenhausen, Isartal, Germany

Filed June 21, 1976, Ser. No. 698,301
Claims priority, application Germany, June 20, 1975, 2527618
Int. Cl.² F23D *11/44, 1/00*; F23R *1/14*
U.S. Cl. 110—28 A **36 Claims**



1. Method for the combustion of pulverized coal, which comprises the steps of:

a. injecting a pulverized coal into a chamber containing atmosphere having the following characteristics:

i. a static pressure of at least 20 mm WG above the static pressure in the fire tube of a boiler, based on a boiler capacity of 250,000 Kcal/h;

ii. an O_2 content of less than 10% by volume; and

iii. a temperature sufficient to heat said pulverized coal at a rate of at least 1000° C/sec;

b. heating the thus injected coal in said chamber at said heating rate to a temperature at least 100° C above the ignition temperature of said coal;

c. mixing the thus heated pulverized coal with a gaseous mixture consisting essentially of combustion air to cause combustion of said coal;

d. accelerating a burning flame jet by means of said excess pressure after combustion of at least 30% of the calorific value of said pulverized coal; and

e. injecting the thus accelerated, still burning flame jet into a gas having a temperature below the ash melting temperature of said pulverized coal.

7. A device for combusting pulverized coal which comprises a combustor having a combustion chamber therein; tangential feeding means having a combustion air flow angle α; a feeding tube for said combustion air connected to said feeding means, said combustor widening conically toward the said combustion chamber, said feeding means being positioned at the narrowest cross-section of said combustor an acceleration nozzle opening into said combustion chamber; said device having the following dimensions for a boiler capacity of 200,000 to 250,000 Kcal/h and a pressure drop of combustion air when flowing through the said combustor of 100 mm WG: a combustion air flow angle α of the tangential feeding means of approximately 7°–11°, an axial length of the tangential feeding means of approximately 85 mm, a combustor intake diameter of approximately 145 mm, a combustor outlet diameter of approximately 290 mm a combustor length of approximately 560 mm, a feeding tube for the combustion air with a diameter of approximately 300 mm; said dimensions, with the exception of the

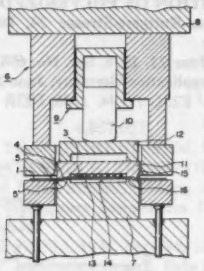
combustion air flow angle α varying with the boiler capacity proportionally with the square root of the capacity ratio.

4,057,022

VESSEL HAVING A PATTERN-MOLDED BOTTOM, A MANUFACTURING PROCESS THEREFOR

Kenji Koshino, and Masayasu Itoh, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 1, 1976, Ser. No. 691,783
Int. Cl.² B21D *51/00, 22/00*
U.S. Cl. 113—120 G **6 Claims**



1. A process of manufacturing a vessel with a pattern-molded bottom, said process being characterized by the following steps:

molding a pattern on an adequate area of a flat blank in the part thereof to become the vessel bottom;

clamping an external part of said blank only outside of said molded pattern; and

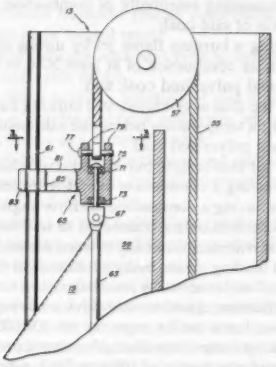
forming the side wall of the vessel by drawing a part outside the clamped part of said blank while said clamping is maintained.

4,057,023

HALYARD RIG FOR ROLL-FURLING MAINSAIL

Frederick E. Hood; Donald K. Mitchell, and Gary S. Uhring, all of Marblehead, Mass., assignors to Hood Sailmakers, Inc., Marblehead, Mass.

Filed Aug. 30, 1976, Ser. No. 718,685
Int. Cl.² B63H *9/04*
U.S. Cl. 114—107 **1 Claim**



1. In a sailboat having a mainsail which roll-furls on its luff edge so as to be self-storing within a hollow mast, the mast having an aft-facing slot through which the mainsail can be drawn, a halyard system comprising:

a sheave at the top of the mast which directs a halyard centrally down into the sail-storing space; and

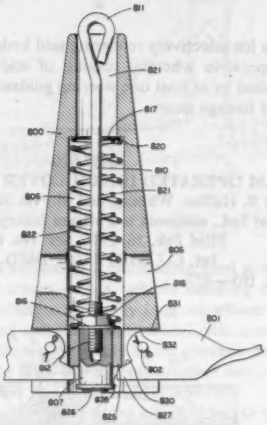
a swivel fitting for joining the halyard to the luff edge of the mainsail, said swivel having a lower portion which attaches to and is freely rotatable with the luff edge of the mainsail and an upper portion which attaches to the halyard and includes a laterally projecting guide which extends aft through said slot and prevents twisting of the halyard during roller furling of said mainsail, said guide including ribs which engage the edges of said slot so as to limit fore and aft movement of the swivel and thereby locate the luff edge of the mainsail essentially centrally within the mast hollow.

4,057,024

RELEASABLE ANCHOR

Truman W. Adams, Indianapolis, Ind., assignor to Indianapolis Center For Advanced Research, Indianapolis, Ind.

Continuation-in-part of Ser. No. 535,953, Dec. 23, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,778
Int. Cl.² B63B *21/44*
U.S. Cl. 114—298 **9 Claims**



1. A releasable anchor comprising:

a body;

an arm pivotally mounted on said body, said arm including a gripping surface, said arm being pivotable between an outwardly-extending position and a retracted position;

a blocking element connected to said body, said blocking element having a blocking position and a release position, said blocking element being movable between the blocking and release positions;

said arm having a first position in which said blocking element is in the blocking position and the gripping surface of said arm frictionally engages said blocking element and prevents movement of said blocking element from the blocking position to the release position, said arm in the first position being intermediate the outwardly-extending position and the retracted position;

biasing means for biasing said arm to the outwardly-extending position;

said arm having a second position corresponding to the outwardly-extending position, said biasing means being operable to move said arm from the first position to the second position, said blocking element being movable from the blocking position to the release position when said arm is in the second position; and

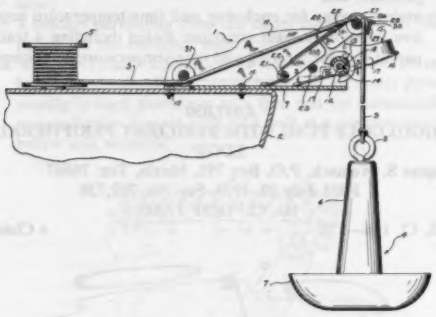
release means for moving said blocking element from the blocking position to the release position, said release means including means for connecting said blocking element to an anchor line, said arm having a third position corresponding to the retracted position, said arm being movable from the second position to the third position when said blocking element is in the release position.

4,057,025

ANCHOR DAVIT

Eugene Gregory Piotrowski, Stevens Point, Wis., assignor to The Worth Company, Stevens Point, Wis.

Filed July 26, 1976, Ser. No. 708,890
Int. Cl.[2] B63B *21/22*
U.S. Cl. 114—210 8 Claims



1. An anchor davit for mounting to a boat, said davit comprising:

a. a frame adapted to extend beyond the edge of a boat,

b. an anchor support member comprising a bearing for said anchor and with said bearing being disposed on the outer end portion of said frame, said bearing being disposed to be normally spaced from the anchor but selectively engageable thereby and always spaced from the anchor cable,

c. a control arm having an inner end portion pivotally mounted to said frame and with said arm normally extending upwardly and outwardly to an end portion disposed above and outwardly of said bearing,

d. a guide mounted on the outer end portion of said arm for receipt of an anchor cable thereover,

e. and means biasing said arm outwardly,

f. said biasing means being overcome upon engagement of said control arm by the end of the anchor during the stowing operation to thereby pivot said control arm rearwardly until the anchor engages and pivots about said bearing into a generally horizontal stowed position

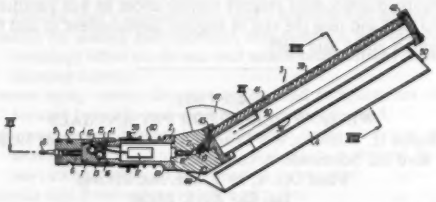
g. said biasing means maintaining the said anchor cable under tension when the anchor is stowed, and functioning to thrust said control arm and anchor outwardly upon release of the said cable.

4,057,026

PYROTECHNIC CUTTER APPARATUS

Georges Joseph Marie Nabucet, 32 rue des 2 freres Guezenec, and Michel Andre Champ, 35 rue Erwan Marec, both of 29200 Brest, France

Filed July 16, 1976, Ser. No. 705,888
Claims priority, application France, Aug. 14, 1975, 75.25313
Int. Cl.[2] B63B *9/00*
U.S. Cl. 114—221 A 16 Claims



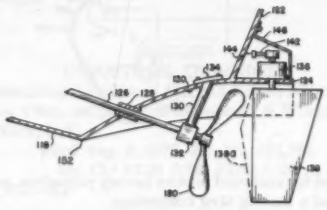
1. A pyrotechnic cutter for cutting an object such as a buoy-rope, tube, cable or the like, comprising a fixed arm containing over substantially its entire useful length an explosive charge having a dihedral covering, the plane of symmetry of the dihedral covering, which substantially corresponds to the plane of a cutting jet comprising gases resulting from explosion of said explosive charge, being directed toward a second arm of the cutter, said second arm being pivotally mounted at one end of said fixed arm, such that explosion of said explosive charge cuts an object enclosed between the two arms; said one end of said fixed arm being fastened to a body releasably connected to an ejector adapted to be engaged in a gun barrel, and an end of the second arm being pivotally connected to said body, said body also carrying control means for maintaining said arms in a separated, open position until said ejector functions, and for closing the second arm toward the first arm upon separation of said body from the ejector, and means in said body for initiating detonation of the explosive charge in the fixed arm at a delayed time after separation of said body from the ejector.

4,057,027

BOAT PROPULSION WITH SURFACE-RUNNING PROPELLER DRIVE

Daniel S. Foster, 19661 Kings Court West, Grosse Pointe Woods, Mich. 48236

Continuation-in-part of Ser. No. 495,661, Aug. 8, 1974, abandoned. This application Nov. 25, 1975, Ser. No. 635,167
Int. Cl.[2] B63H *5/16*
U.S. Cl. 115—39 12 Claims



1. A boat having a transversely convex deep-vee planing type hull in which the bottom of the hull comprises generally flat surfaces which intersect to define the keel of the hull and which extend upward and outwardly from the keel at equal angles between 15° and 30° from the transverse plane through the keel,

said hull having a transom at the stern extending upwardly and preferably slightly rearwardly from the keel,

said boat having inboard engine means located aft of the longitudinal center of the boat, the weight and location of the engine means with respect to the hull characteristics being such that at rest in the water, the keel of said hull is inclined forwardly and upwardly at a small angle from the horizontal and at planing speeds the forward and upward inclination of the keel is at a substantially greater angle,

said hull having a water flow duct in its bottom located to extend forwardly and downwardly from the intersection between the bottom of the hull and the transom, said duct being open downwardly through the bottom of the hull and open rearwardly through the transom,

a propeller located in alignment with the duct and adjacent the plane occupied by the transom,

said duct comprising a downwardly and rearwardly open transversely curved channel intersecting the transom to define therewith an opening having an approximate radius slightly greater than the radius of the propeller, and including a top wall which is forwardly and downwardly curved to intersect the bottom of the hull in sharp cornered intersections a short distance forward of the transom, the sharp cornered intersections between the top front wall of said duct and the bottom of said hull being effective at planing speed to cause water flowing rearwardly along the bottom of the hull to break away from

the bottom surface of the hull and to prevent this water from flowing along the duct surface into said duct,

said propeller having a propeller shaft connected to the engine means extending into the interior of the hull and inclined slightly forwardly and upwardly to position the center of rotation of the propeller generally directly astern of and closely adjacent to the horizontal plane which extends rearwardly from the sharp cornered intersections when said boat is at planing inclination to provide for running of said propeller in half-submerged condition,

a splash guard extending rearwardly of said transom from said duct in general alignment therewith and positioned to intercept the spray produced by said surface running propeller and

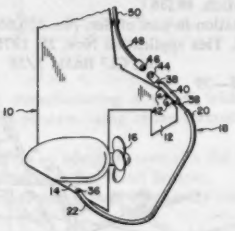
a rudder directly astern of said propeller to receive water projected rearwardly thereby.

4,057,028

OUTBOARD MOTOR PROPELLER GUARD

Mike F. Palka, 7651 S. Wolf Road, LaGrange, Ill. 60525

Filed Nov. 2, 1976, Ser. No. 738,316
Int. Cl.² B63H *5/16*
U.S. Cl. 115—42 **2 Claims**



1. A guard for outboard motors having propellers, propeller housings and a trailing skeg conprising:

a. "C" shaped resilient propeller guard bar having a first and a second end;

b. means for pivotally attaching said second end of the guard bar to the propeller housing at a point below said propeller;

c. an upwardly extending semi-rigid cable slidably contained within a semi-rigid sheath affixed to said skeg, one end of said cable in communication with the transmission control for said outboard motor;

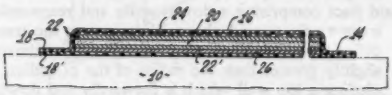
d. means for connecting the second end of said semi-rigid cable to the first end of said guard bar such that pivotal movement of the guard bar induces translational movement of said cable within said sheath providing control of said motor transmission thereby.

4,057,029

TIME-TEMPERATURE INDICATOR

Charles Seiter, Los Angeles, Calif., assignor to Infratab Corporation, Santa Monica, Calif.

Filed Mar. 8, 1976, Ser. No. 664,998
Int. Cl.² G01K *3/04, 11/12*
U.S. Cl. 116—114 V **21 Claims**



10. A time-temperature indicating device for indicating deterioration of perishable goods and the like, said device comprising:

a time-temperature sensitive component including a reactant material and an indicator responsive to contact by said reactant to produce a visible reaction, said reactant and indicator being normally separated by a diffusion layer having an impermeable, pseudo-crystalline state and a reactant permeable, liquidcrystalline state, said diffusion layer effecting the transition between said impermeable and permeable states at a clearly defined transition temperature; and

container means for enclosing said time-temperature sensitive component, said container means including a transparent face for viewing said time-temperature component.

4,057,030

RIGID GOLF FLAG WITH RESILIENT PERIPHERAL EDGE

Eugene S. Womack, P.O. Box 791, Mexia, Tex. 76667

Filed July 29, 1976, Ser. No. 709,728
Int. Cl.² G09F *17/00*
U.S. Cl. 116—175 **4 Claims**

1. A golf hole flag assembly, said assembly including an upright staff adapted to be supported upright from a hole cup, the upper end portion of said staff including vertically spaced upper and lower horizontally enlarged and outwardly projecting flanges extending thereabout and including upper bearing surfaces, a flag support including an upstanding rod provided with vertically spaced and aligned horizontally outstanding upper and lower support rings on its upper and lower end rotatably mounted on said staff with the upper and lower rings disposed above and rotatably engaged with said bearing surfaces and said rod spaced outwardly from said staff and flanges, an upstanding flag member including an upstanding rigid panel member constructed of weather resistant material, said panel member being generally circular in shape, but including one straight upstanding side marginal edge portion at one side edge thereof provided with vertically spaced and aligned horizontal transverse apertures formed therethrough, said straight upstanding marginal edge portion being defined by an integral horizontally outwardly projecting and elongated upstanding tab portion of said panel member, the peripheral edge portion of said panel member extending thereabout from the upper end of said tab portion to the lower end of said tab portion being substantially continuously arcuate and having a resilient covering secured thereover to protect the greens grass from damage if dropped thereupon, said rod intermediate the upper and lower ends thereof, including means defining vertically spaced loops supported therefrom, said apertures being horizontally registered with said loops, and attaching links loosely passed through corresponding pairs of apertures and loops supporting said panel member from said rod for angular displacement relative thereto about an axis paralleling said staff and thus the axis of angular displacement of said flag support about said staff.

4,057,031

WINDOW PERCH FOR PET ANIMALS

Charles H. Williams, and Charles E. Williams, both of 5958 N. 83rd St., Scottsdale, Ariz. 85252

Filed Oct. 1, 1975, Ser. No. 618,441
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **2 Claims**

1. A perch for use in combination with a wall having a window therein for providing a seating place for a small pet

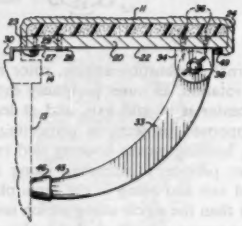
animal and for holding and displaying plants and other objects, said perch comprising:

a. a substantially horizontal rigid plate have top and under surfaces and having an inboard edge adjacent said window and an outboard edge opposite said inboard edge;

b. window engaging means extending from said inboard edge of said plate and including a downwardly extending portion detachably enagageable with the sill of said window;

c. a bracket depending from the under surface of said plate proximate the outboard edge thereof;

d. a leg pivotally connected at one end thereof to said bracket and extending from said one end arcuately downwardly inward therefrom to a free end for substantially perpendicular contact with said wall at a position spaced below said window;



e. locking means for selectively positionally retaining said leg relative said bracket, said locking means comprising a high friction material grommet and means to selectively increase or decrease the axial compression on said grommet, whereby the leg is frictionally retained in a selected position, before further increase of said compression locks said leg in a selected position;

f. a friction member having a high coefficient of friction in the form of a cup, the sides of said cup extending over said free end and thereby mounting said friction member on said free end, whereby the bottom of said cup abuts against said wall;

g. whereby the thrust of said leg, through said friction member, perpendicularly against and downwardly along said wall, does not result in skidding of said friction member downwardly along said wall, with consequent collapse of said perch.

4,057,032

ANIMAL BATHING APPARATUS

James Christ Dimitriadis, 25261 Earhart Road, Laguna Hills, Calif. 92653

Filed Aug. 9, 1976, Ser. No. 712,649
Int. Cl.[2] A61D *11/00*
U.S. Cl. 119—1 **8 Claims**

1. An animal-bathing apparatus comprising:

an adjustable, tubular, frame structure having front and rear support strut members;

a liquid-impervious housing cover of a flexible material defining a bathing compartment having access openings therein, and a rear entrance and a forward exit opening;

means for sealing said openings, said entrance, and said exit openings when not in use, said means being affixed to said housing cover;

water spray means disposed within said compartment and located between said strut members therein; and

drainage means formed to receive said frame structure and said housing therein, whereby said water is drained from said compartment of said housing cover; and

wherein said front-support strut comprises:

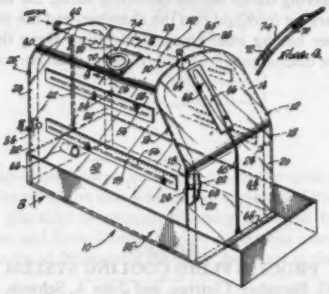
an upper tubular portion having a substantially inverted U-shaped configuration with depending arm members, said upper portion being bent rearwardly therefrom;

a pair of forward leg members arranged to slidably receive said arm members of the front support strut; and

locking means mounted to said leg member, whereby said upper portion is locked in a predetermined height; and

wherein said rear-support strut comprises:

an upper tubular portion having a substantially inverted U-shaped configuration with depending arm members;



a pair of rearward leg members arranged to slidably receive said depending arm members; and

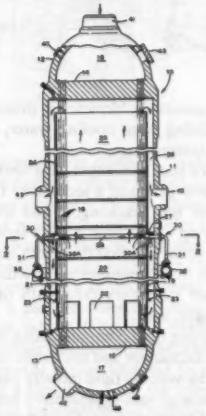
locking means mounted to said leg members, whereby said upper portion thereof is locked in a predetermined height.

4,057,033

INDUSTRIAL TECHNIQUE

John Schlichting, Lynchburg, Va., and Robert Norman Tornow, Clinton, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 8, 1975, Ser. No. 602,941
Int. Cl.[2] F22B *1/06*; F22D *1/00*
U.S. Cl. 122—32 **4 Claims**



1. A heat exchanger comprising an upright pressure vessel, a plurality of tubes extending through the vessel, shroud means surrounding the tubes to form a vapor generating and superheating passage and cooperating with the vessel to form inlet and outlet passages communicating with the vapor generating and superheating passage, means for directing a heating fluid through the tubes, means for introducing and serially directing a feedfluid in through the inlet passage, through the vapor generating and superheating passage in indirect heat exchange relation with the heating fluid, and out through the outlet passage, means for withdrawing a portion of the vaporized

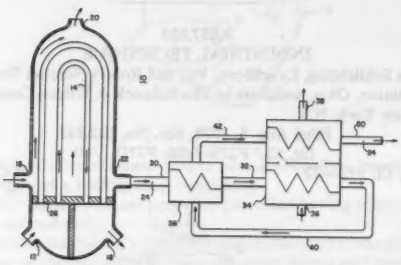
feedfluid from the vapor generating and superheating passage for mixing with the feedfluid entering the inlet passage, and wherein the means for introducing feedfluid into the inlet passage includes a plurality of spaced coplanar nozzles discharging into the inlet passage, each of the nozzles comprising horizontally disposed inner and outer tubular members having closed adjacent end faces and cooperating with one another to form an enclosed chamber therebetween, the inner tubular member having outlet means extending along the top thereof for discharging feedfluid into the chamber, and the outer tubular member having outlet means extending along the bottom thereof for discharging feedfluid from the chamber to said inlet passage.

4,057,034

PROCESS FLUID COOLING SYSTEM

Norman G. Farquhar, Clairton, and John A. Schwab, Scottdale, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 15, 1975, Ser. No. 577,955
Int. Cl.² F22B *37/54*
U.S. Cl. 122—382 **5 Claims**



1. In a steam generator blowdown processing system of a nuclear plant utilizing plant cooling water, means for cooling blowdown fluid comprising:

a. a regenerative heat exchanger, said heat exchanger having a primary flow path and a secondary flow path,

b. a triple flow heat exchanger, said triple flow heat exchanger having a first flow path, a second flow path, and a third flow path, said first flow path and said second flow path being in fluid communication with said primary flow path and said secondary flow path of said regenerative heat exchanger, and

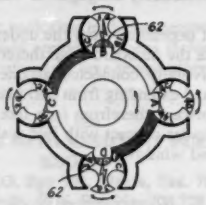
c. means providing fluid communication between said regenerative heat exchanger and said triple flow heat exchanger so that said blowdown fluid initially passes through one of said flow paths of said regenerative heat exchanger and is cooled, then through one of said first flow path and said second flow path of said triple flow heat exchanger to further cool said blowdown fluid, then through the other of said primary flow path and said secondary flow path of said regenerative heat exchanger to reheat said previously cooled fluid, and then through the other of said first flow path and said second flow path of said triple flow heat exchanger to recool said previously cooled and reheated fluid, said plant cooling water being passed through said third flow path in heat transfer relation with said first flow path and said second flow path to cool said fluid in said first flow path and said second flow path.

4,057,035

INTERNAL COMBUSTION ENGINES

Cherng Yi Su, Rua Topazio 380, Aclimacao, Sao Paulo, S.P., Brazil

Filed Mar. 11, 1976, Ser. No. 666,142
Int. Cl.² F02B *53/00, 55/14;* F01C *1/08*
U.S. Cl. 123—8.27 **7 Claims**



1. In an internal combustion engine, rotor means having a central axis of rotation, an outer periphery extending along a circle whose center is in said axis, and at least one pair of diametrically opposed projections projecting radially from said periphery, housing means housing said rotor means and having an inner periphery extending along a circle whose center is in said axis and being in the same plane as and of a diameter larger than the circle along which said outer periphery of said rotor means extends so that said peripheries define between themselves an annular channel, said projections having outer ends slidably and fluid-tightly engaging the inner periphery of said housing means for dividing said channel into a plurality of channel portions, fluid-control means operatively connected with said housing means and communicating with said channel for controlling flow of combustible fluid into said channel and flow of exhaust gases out of said channel, and combustion-chamber means connected with said housing means and communicating with said channel for receiving combustible fluid from said channel and for releasing the fluid after combustion thereof into said channel for expansion therein while engaging first one and then the other of said projections for driving said rotor means in rotation with respect to said housing means, whereby the combustible fluid, the exhaust gases, and the expanding gases of combustion are all compelled to flow circumferentially along said channel in said channel portions thereof defined between said projections, said fluid-control means and said combustion-chamber means are each in the form of a rotary sealing means capable of rotating with respect to said housing means while having a sealed, fluid-tight engagement therewith, each rotary seal means including a rotary member extending into said channel and having a fluid-tight engagement with said outer periphery of said rotor means between said projections thereof, each rotary member being formed with at least one pocket for receiving each projection as it turns past each rotary member, and drive means extending between and operatively connected with said rotor means, on the one hand, and the rotary members, on the other hand, for rotating the latter in timed relation with respect to said rotor means for situating said pocket of each rotary member at an angular position for receiving each projection as it travels past each rotary member and wherein said rotor means rotates at a substantially constant speed while said drive means drives said rotary members at a variable speed which is at a maximum when each projection is in the vicinity of and travels past a rotary member and which becomes gradually smaller and then increases as each projection travels away from one rotary member and approaches the next rotary member, respectively, and wherein an output shaft is fixed to said rotor means for rotation therewith and extends therefrom outwardly beyond said housing means, said output shaft forming part of said drive means, and said drive means further including a lobed gear fixed to said output shaft and having at least one lobe, an eccentric gear meshing with said lobed gear to be driven thereby, an eccentric shaft fixed eccentrically to

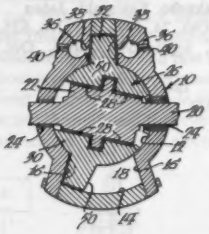
said eccentric gear and extending therefrom, a further gear fixed to said eccentric shaft for rotation therewith, an ring gear surrounding said output shaft and meshing with said further gear, and a pair of gears fixed coaxially to said rotary members and meshing with said ring gear, so that through said gears of said drive means said rotary members are rotated in timed relation with said rotor means while said lobed gear provides the variable speed of rotation for said rotary members.

4,057,036

ROTARY ENGINE WITH VARIABLE ORIFICE PRECHAMBER

Myron R. Gibson, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 1, 1976, Ser. No. 662,500
Int. Cl.[2] F02B *53/10*
U.S. Cl. 123—8.09 **2 Claims**



1. In a rotary engine, the combination comprising:
a housing having walls defining an operating chamber;
a prechamber associated with said housing;
an opening in one of said walls establishing fluid communication between said chamber and said prechamber;
means for introducing fuel into said prechamber;
a shaft journalled in said housing and extending through said chamber;
a rotor journalled on said shaft within said chamber and having a surface cyclically brought into proximity with said one wall and said opening for cyclically compressing an oxygen containing medium within said prechamber;
a control recess in said surface located to pass said opening during engine operation at about or subsequent to maximum compression of said medium and having a configuration such that the flow of combustion gases from said prechamber into said operating chamber is controlled by the shape of said surface about said recess and the proximity of said surface and said recess to said opening at a predetermined, desired rate; and
an additional recess in said surface separate from said control recess, and located to permit free entry of said medium into said opening prior to maximum compression of said medium.

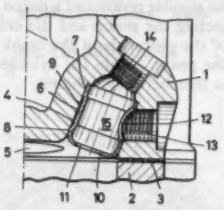
4,057,037

SPARK-IGNITED INTERNAL COMBUSTION ENGINE OPERATED WITH CHARGE STRATIFICATION

Kurt Reichel, Wolfsburg; Gerd Decker, Vorsfelde; Alfred Kuck, Isenbuttel, and Erwin Schulz, Gifhorn, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Germany

Filed Nov. 17, 1975, Ser. No. 632,699
Claims priority, application Germany, Nov. 21, 1974, 2455070
Int. Cl.[2] F02B *19/10*
U.S. Cl. 123—32 SP **10 Claims**

1. In a spark ignited internal combustion engine operated with charge stratification and including a cylinder head having a main combustion chamber, a cavity defined by surrounding walls of the cylinder head, and an auxiliary combustion chamber formed within a cup-shaped insert positioned in the cavity, the cup-shaped insert being thin-walled and having an opening providing a passage connecting the main combustion chamber and the auxiliary combustion chamber, an opening for receiving a fuel delivery device and an opening for receiving an ignition device; the improvement wherein:
the cavity opens toward the main combustion chamber and



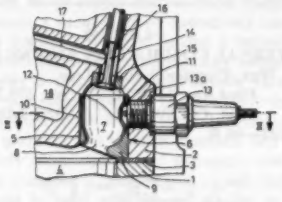
the cup-shaped insert opens away from the main combustion chamber, the side wall of the cup-shaped insert having a plurality of regions spacedly arranged from one another and force-fittedly applied against the inner wall of the cavity to frictionally maintain the insert in the cavity.

4,057,038

AUXILIARY COMBUSTION CHAMBER FOR A STRATIFIED CHARGE INTERNAL COMBUSTION ENGINE

Kurt Reichel, Wolfsburg; Gerd Decker, Vorsfelde; Hans-Alfred Kuck, Isenbüttel, and Walter Brandstetter, Gifhorn, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Germany

Filed Apr. 30, 1976, Ser. No. 681,817
Claims priority, application Germany, May 22, 1975, 2522585
Int. Cl.[2] F02B *19/10, 19/16*
U.S. Cl. 123—32 SP **3 Claims**



1. An auxiliary combustion chamber, usable in a stratified charge internal combustion engine having at least one main combustion chamber enclosed by a cylinder and a cylinder head and an exhaust passage in said cylinder head, comprising an inert secured in a bore on said cylinder head, said bore being adjacent to said exhaust passage, said insert comprising a tubular shell, having openings for ignition means and fuel supply means and having a passage communicating with said main combustion chamber, said shell having a relatively thin walled section which is in close contact with the interior wall of said bore in a circumferential region adjacent to said exhaust passage and which has a clearance from the interior wall of said bore in the remaining circumferential regions.

4,057,039

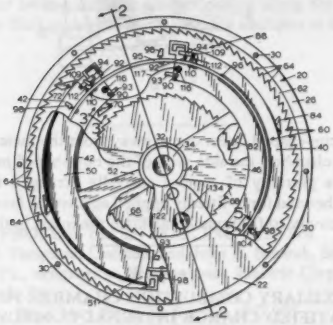
ENGINE HAVING ALTERNATELY ROTATING ORBITAL PISTONS AND CYLINDERS

Adolf P. Pinto, 1807 Hunt Ave., Richland, Wash. 99352

Filed May 7, 1976, Ser. No. 684,156
Int. Cl.[2] F02B *57/00*
U.S. Cl. 123—43 B **8 Claims**

1. A rotary engine comprising:
a. a non-rotatable frame,
b. a crank rotatably journaled centrally in the frame,

c. at least one annular cylinder having closed end portions and a connecting rod, the connecting rod interconnecting the cylinder and the crank for free orbital rotation of the cylinder about the crank and configured to position the cylinder within the frame,
d. at least one annular piston and a piston rod, the piston rod interconnecting the piston and the crank for free orbital rotation of the piston about the crank and configured to position the piston within the cylinder for reciprocating movement therebetween, wherein



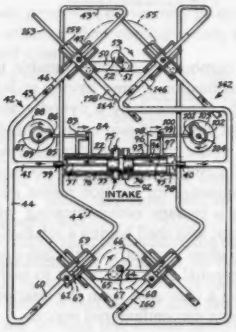
e. the cylinder defines an arc of greater extent than the piston forming a combustion chamber at each end thereof, and
f. escapement means configured to automatically, selectively, intermittently interengage the piston and cylinder with the frame and crank in a manner to transfer orbital rotation of the piston and cylinder in a first direction to the crank and prevent orbital rotation of the piston and cylinder in the opposite direction relative to the frame.

4,057,040

INTERNAL COMBUSTION ENGINE SYSTEM

Archie E. Wax, Kingston Springs, Tenn.

Filed Apr. 12, 1976, Ser. No. 675,710
Int. Cl.² F02B *75/32;* F02G *3/00*
U.S. Cl. 123—46 R **16 Claims**



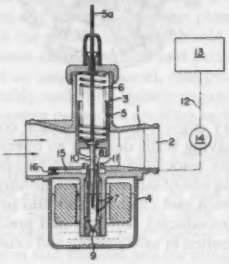
1. An internal combustion engine system comprising:
a. combustion cylinder means having intake and exhaust means,
b. an engine piston reciprocable in said cylinder means, and having intake, compression, power and exhaust strokes,
c. power output means,
d. link means connecting said piston and said power output means whereby said power stroke is substantially greater than said intake stroke,
e. said link means comprising hydraulic circuit means having a ram passage, first branch circuit means communicating with said ram passage, and second branch circuit means communicating with said ram passage,
f. a ram operatively connected to said engine piston and reciprocably movable in said ram passage,
g. a slow displacement piston movable in said first branch circuit means,
h. a fast displacement piston movable in said second branch circuit means, and
i. transmission means operatively connecting said displacement pistons and said power output means causing said fast displacement piston to move in said second branch circuit means at a speed faster than said slow displacement piston moves in said first branch circuit means.

4,057,041

ICING PREVENTING DEVICE FOR A CARBURETOR FOR TWO-CYCLE ENGINE USE

Makoto Sakai, Kawasaki, Japan, assignor to Kabushiki Kaisha Keihinseiki Seisakusho, Kawasaki, Japan

Filed Oct. 24, 1975, Ser. No. 625,512
Claims priority, application Japan, Oct. 28, 1974, 49-129482[U]
Int. Cl.² F02B *33/04*
U.S. Cl. 123—73 AD **2 Claims**



1. In a carburetor for a two-cycle internal-combustion engine having a casing with an intake air passage, a throttle valve slidably mounted in said casing, a fuel nozzle having an outlet opening into the intake air passage and a needle valve mounted on an end face of the throttle valve and projecting therefrom into the fuel nozzle, the improvement comprising an icing-preventing device including an oil nozzle connected to a source of lubricating oil and opening into the intake air passage in a position adjacent the outlet of the fuel nozzle, said oil nozzle having an annular outlet encircling said fuel nozzle.

4,057,042

AIR-FUEL MIXTURE CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES USING DIGITALLY CONTROLLED VALVES

Shigeo Aono, Seki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 7, 1975, Ser. No. 630,078
Claims priority, application Japan, Nov. 8, 1974, 49-128134; Apr. 24, 1975, 50-49175
Int. Cl.² F02B *33/00*
U.S. Cl. 123—119 EC **1 Claim**

1. Emission control apparatus for an internal combustion engine having, an induction pipe having a venturi, an exhaust pipe, an air-fuel mixing chamber communicated to the venturi of the induction pipe for delivery of a mixture of air and fuel to the induction pipe by the venturi action, a source of fuel at atmospheric pressure, fuel supply conduit means for delivery of fuel from said source to said mixing chamber, air bleed conduit means for delivery of air to said mixing chamber, and a pulse operated air-fuel proportioning device disposed in the fuel supply and air bleed conduit means to control the ratio of

air and fuel delivered to said mixing chamber in response to pulse signals applied thereto, the apparatus including:

means disposed in the exhaust pipe for sensing the concentration of an exhaust composition of the emissions from the engine to provide a concentration representative signal;

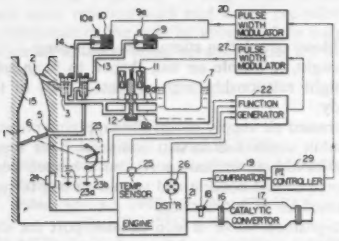
means comparing the concentration representative signal with a reference value representing a desired air-fuel ratio to provide a signal representative of the deviation of the detected concentration from the desired value; and

means modulating the magnitude of the deviation representative signal in accordance with a predetermined control characteristic to provide an error correction signal;

a pulse-width converter converting the error correction signal into a train of pulses with a duration dependent upon the magnitude of the error correction signal, wherein the pulse-width converter comprises:

first and second capacitors; and

first, second and third transistors each having a control electrode and first and second controlled electrodes, the first controlled electrodes of said first and second transistors being connected to a first terminal of a voltage supply, the second controlled electrode of the first transistor being connected through said first capacitor and through the first and second controlled electrodes of the third



transistor to a second terminal of the voltage supply, the junction between the first capacitor and the first controlled electrode of the third transistor being connected to the control electrode of the second transistor, the second controlled electrode of the second transistor being connected through said second capacitor to the control electrode of the first transistor, the junction between the control electrode of the first transistor and the second capacitor being connected to the second terminal of the voltage supply, the control electrode of the third transistor being connected to receive said error correction signal, the second confrolled electrode of the second transistor being connected to said second terminal of said voltage supply via said pulse-operated air-fuel proportioning device disposed in the air bleed conduit means, so that the first capacitor is charged linearly through the first and second controlled electrodes of the third transistor when the first transistor is conductive at a rate proportional to the error correction signal to thereby render the second transistor conductive when the voltage across the first capacitor reaches the threshold level of the second transistor for a duration inversely proportional to the error signal, whereby the air-fuel proportioning device is activated at periodic intervals related to the error correction signal.

4,057,043

EXHAUST GAS RECIRCULATION SYSTEM

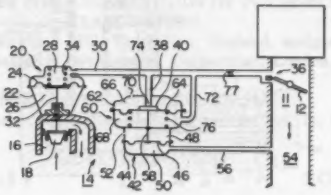
Tetsuya Harada, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed June 11, 1976, Ser. No. 694,944

Claims priority, application Japan, June 13, 1975, 50-80387[U]

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **10 Claims**



1. An exhaust gas recirculation system for an internal combustion engine, comprising an exhaust gas recirculation (EGR) passageway for feeding exhaust gases of said engine into an intake passageway of said engine, an exhaust gas recirculation (EGR) control valve disposed in said EGR passageway, a vacuum actuator operatively connected to said EGR control valve and having a first vacuum chamber subjected to the vacuum in said intake passageway adjacent to a throttle valve rotatably mounted therein, said EGR control valve being operable in response to the vacuum in said first vacuum chamber to control the amount of the engine exhaust gases fed into said intake passageway, passage means communicating with the atmosphere and with said first vacuum chamber to feed atmospheric air thereinto to reduce the vacuum in said first vacuum chamber, an air supply control valve associated with said passage means, a vacuum servo operatively connected to said air supply control valve and having a second vacuum chamber subjected to an intake passageway vacuum in said intake passageway downstream of said throttle valve, said air supply control valve being operable in response to the vacuum in said second vauum chamber to control the amount of atmospheric air fed into said first vacuum chamber, and operating means operatively connected to said air supply control valve and operable in response to the vacuum in said first vacuum chamber reduced by said atmospheric air fed to minutely adjust the degree of opening of said air supply control valve to minutely adjust the amount of atmospheric air fed into said first vacuum chamber to thereby make it possible for said EGR control valve to meter the amount of said engine exhaust gases fed into said intake passageway to a predetermined ratio to the amount of air drawn into said engine.

4,057,044

HYDRAULIC ANEROID CONTROL AND FLUID FLOW RESTRICTING DEVICE FOR USE THEREWITH

Steven Anthony Reich, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

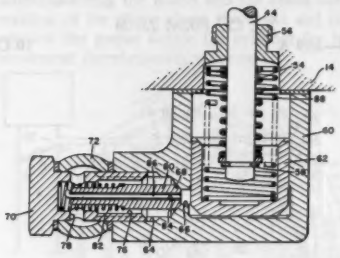
Filed Jan. 19, 1976, Ser. No. 650,182

Int. Cl.² F02D *1/04*

U.S. Cl. 123—140 MP **7 Claims**

1. In a fuel injection pump assembly for use with a turbocharged internal combustion engine, the injection pump assembly including a governor controlled fuel control rack, an aneroid adapted to be connected to and responsive to pressure within the intake manifold of the engine with which it will be used to limit movement of the fuel control rack in a direction to increase fuel delivery during periods of low intake manifold pressure, the aneroid having a control member shiftable between rack engaged and disengaged positions, means resiliently urging the shiftable control member to the rack disengaged position, and hydraulic cylinder and piston means

adapted to be connected to and responsive to fluid pressure from the oil pump of the engine with which it will be used to move the shiftable control member to the rack engaged position, the improvement comprising: the piston of the hydraulic cylinder and piston means having a predetermined amount of



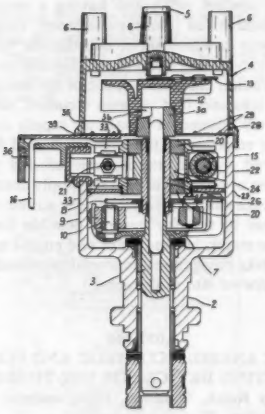
travel prior to contacting and moving the shiftable member, and the hydraulic cylinder and piston means includes a flow restricting means limiting the flow of fluid thereto whereby, when in use with an engine the aneroid will be unable to limit fuel control rack movement until a period of time after the oil pump of the engine has operated at pressure.

4,057,045

MAGNETIC PULSE TYPE IGNITION DISTRIBUTOR

Jean-Henri Stellwagen, Paris, France, assignor to Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal, Issy les Moulineaux, France

Filed Feb. 14, 1975, Ser. No. 549,904
Claims priority, application France, Oct. 16, 1974, 74.34751
Int. Cl.[2] F02D *7/02*
U.S. Cl. 123—146.5 A **16 Claims**



1. In an ignition distributor adapted to be supplied by an ignition coil, said distributor comprising a housing, a drive shaft in said housing, a distributor cap for said housing which carries an input terminal and a plurality of output terminals, and a rotor arm driven by said shaft for successively connecting each output terminal to said input terminal; and

a pick-up assembly in which said shaft rotates, said assembly comprising a timer core fixed to said shaft, a magnetic circuit having stationary poles positioned in alignment with said timer core, an induction coil coupled to said magnetic circuit to produce electrical pulses for controlling the opening and closing of the supply circuit of said ignition coil as said timer core rotates, and two substantially parallel non-magnetic cheek plates encircling said shaft on opposite sides of said timer core,

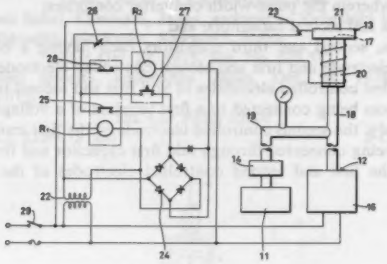
the improvement which comprises two bearing surfaces one on each side of and fixed to the timer core, and bearing means positioned between said bearing surfaces and the cheek plates of the pick-up assembly.

4,057,046

BLOOD CIRCULATION STIMULATOR

Mamoru Kawaguchi, No. 100, Shimo-Nakashima, Arita, Wakayama, Japan

Filed May 17, 1976, Ser. No. 687,372
Claims priority, application Japan, June 14, 1975, 50-72387
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—24 R **2 Claims**



1. A blood circulation stimulator comprising:

an airtight, inflatable air bag shaped to fit in substantially airtight relationship with at least a part of the human body;

compressed air supply means for supplying compressed air;

a conduit connected to said compressed air supply means and having an exhaust port, and a branch conduit connected to said conduit and to said air bag to supply compressed air to said air bag;

a two-position valve at said exhaust port for closing said exhaust port in one position and opening said exhaust port in the other position, and solenoid means connected to said valve for urging said valve to the closed position when energized and forced to the open position by compressed air to open said exhaust port when the pressure of air in said conduit overcomes the magnetic force of said solenoid means; and

an electrical circuit coupled to said solenoid means for energizing said solenoid means to move said valve to close said exhaust port and hold said valve closed until the force of the solenoid means is overcome, and electrically detecting the movement of said valve for opening of said exhaust port and re-energizing said solenoid means a predetermined time after said opening to reclose said exhaust port, thereby subjecting the human body to repeated application and release of pressure, and a further negative pressure responsive exhaust valve in which said branch conduit for assisting rapid release of compressed air from said air bag when said exhaust port is opened.

4,057,047

MAGNESIUM SULFATE ANHYDROUS HOT PACK HAVING AN INNER BAG PROVIDED WITH A PERFORATED SEAL

Rodger L. Gossett, Red Bud, Ill., assignor to American Medical Products Company, St. Louis, Mo.

Division of Ser. No. 475,032, May 31, 1974, Pat. No. 3,950,158. This application Jan. 19, 1976, Ser. No. 650,080
Int. Cl.[2] F24J *1/02*
U.S. Cl. 126—263 **7 Claims**

1. In a hot pack for use in providing an increase in tempera-

ture from the ambient temperature comprising a group of three pliable sleeve type plastic bags, two of said bags being of approximately the same size and strength forming the exterior and contiguous interior major liners of the pack, an inner bag comprising a minor liner being formed as a sleeve type bag and having dimensions and strength substantially less than the combined major liners enveloping said inner bag, the upper marginal seams of said major and minor liners being co-extensive and sealed together to form the upper end of the pack, the lower end the minor liner having a closing seam being capable of pressure rupture upon application of manual force, said inner bag having a seal extending below the upper marginal

seams, the improvement which consists of a perforation provided through said inner bag within the seal provided below the upper marginal seams to provide a pressure relief at the time of activation of the pack to prevent the pressure from acting against the upper marginal seams and thereby cause rupture of the pack proximate said seams, the inner bag disposed for holding a quantity of water, the interior major liner disposed for holding a quantity of magnesium sulfate anhydrous which upon reaction with said water provides for an increase in temperature, the ratio by volume of the magnesium sulfate anhydrous to water being between about a 1 to 1 ratio to a 1 to 2 ratio.

4,057,048

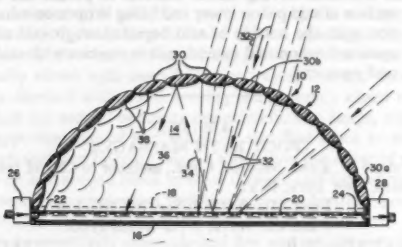
SOLAR HEAT COLLECTOR

DeWitt C. Maine, Redmond, Oreg., assignor to Maineline Sales Co., Inc., Redmond, Oreg.

Filed Nov. 12, 1975, Ser. No. 630,992

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **6 Claims**



1. A solar heat-collecting structure comprising:

a roof structure generally curved to define an enclosure for receiving direct solar light radiation from variable sun positions,

a planar heat-collecting surface forming a floor of said enclosure,

a plurality of light lenses disposed within and comprising an integral portion of said roof structure, such lenses having various and different focal lengths and being fixedly disposed in various and different attitudes determined by such lenses' locations in said roof structure for collectively transmitting, directing and focusing solar light radiation received from variable sun positions onto different portions of said planar heat-collecting surface to cause simultaneous heating of said different portions,

said roof structure having a light-reflective interior surface, such surface including the inwardly facing surfaces of said light lenses for reflecting light radiation incident to such light-reflective interior surface back toward said heat-collecting surface while concurrently transmitting solar light radiation into said enclosure and onto said heat-collecting surface.

4,057,049

APPARATUS FOR AND METHODS OF PULSE-ECHO EXAMINATION

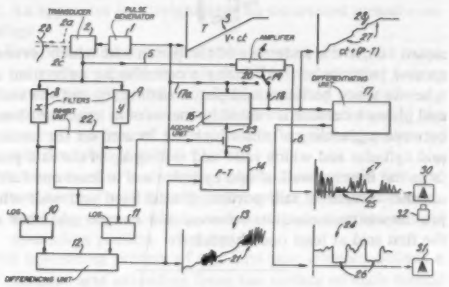
Christopher Rowland Hill, Carshalton, England, assignor to National Research Development Corporation, London, England

Filed Oct. 7, 1975, Ser. No. 620,318

Claims priority, application United Kingdom, Oct. 11, 1974, 44090/74

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 V **7 Claims**



1. Apparatus for the examination of a specimen by pulse-echo methods including:

means for emitting at least one examining beam at such a specimen, for receiving echoes of said at least one beam returned from targets within a sub-volume of said specimen and for producing an echo signal;

means for deriving at least two sets of echo-amplitude information signals from said echo signal;

means for producing a first display derived from said echo signal indicating, in a manner substantially independent of the attenuating character of said specimen, and varying as a function of the amplitude of the echo signal, the echo-producing character of said specimen within said sub-volume;

means for comparing and processing said two sets of echo-amplitude information signals to produce a compensation signal indicative of the variation in the attenuation that beams undergo in passage through said specimen to and from sub-volumes within it; and

means for applying said compensation signal to said first display to vary the amplitude of the display to compensate for distorting effects of the said variation in attenuation.

4,057,050

DEVICES FOR EXTRACTING BLOOD

Walter Sarstedt, 5223 Numbrecht, Rommelsdorf, Germany

Filed Nov. 26, 1975, Ser. No. 635,779

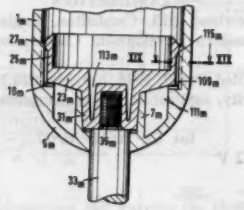
Claims priority, application Germany, Nov. 29, 1974, 2456561; July 25, 1975, 2533256

Int. Cl.² A61M *5/315, 1/00*

U.S. Cl. 128—2 F **37 Claims**

36. A device for extracting blood, the device comprising a cylinder having a first end and a second end, a removable closure member at said first end of said cylinder and a fixed end wall at said second end of said cylinder, a connection means for a cannula carried on said closure member, a piston guided in

said cylinder in an air-tight manner and having a sealing lip, a piston rod guided in a central bore in said fixed end wall, an extension of said piston for releasably receiving said piston rod provided on that end of said piston remote from said closure member, a portion of said fixed end wall forming a rigid stop for said piston in its retracted position, an annular sleeve means concentrically surrounding said central bore provided on said fixed end wall for receiving and retaining said extension of said piston, an annular chamber which surrounds the annular sleeve



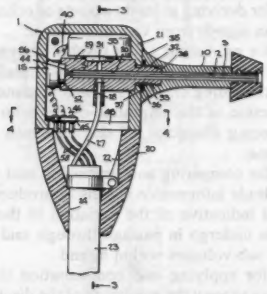
means below the underside of the piston and which serves to receive particles of fluid during a centrifuging operation, and wherein space between said piston sealing lip and the end of said piston extension is vented by means of at least one channel between a plurality of ribs which are located on the inside of said cylinder and which raise said sealing lip of the said piston from the interior wall of said cylinder and at least one further channel formed in said portion of said fixed end wall which provides communication between said annular chamber and the first said at least one channel.

4,057,051

HAND HELD EAR TEST PROBE

Adrian R. Kerouac, Litchfield, N.H., assignor to American Electromedics Corporation, Acton, Mass.

Filed Dec. 29, 1975, Ser. No. 645,082
Int. Cl.² A61B *5/12*
U.S. Cl. 128—2 Z **4 Claims**



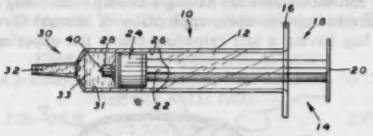
1. An improved ear test probe comprising the combination of:
- an ear tube support including a lower tapered hand gripping portion and an upper hollow portion;
- an ear tube projecting from the upper hollow portion of said support;
- a plurality of conduits in said ear tube;
- a transfer case in said upper hollow portion;
- air coupling means in said transfer case to couple one of said conduits to a source of air under pressure; and
- a transmitter transducer coupled to one conduit in said air tube by said transfer case and a receiver transducer coupled to another conduit in said ear tube by said transfer case.

4,057,052

BLOOD-GAS SYRINGE

Joseph Kaufman, Emerson, and Alois G. Prais, Garfield, both of N.J., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Filed Oct. 26, 1976, Ser. No. 735,162
Int. Cl.² A61B *5/00*
U.S. Cl. 128—2 F **5 Claims**



1. A syringe, which comprises;
- a cylindrical barrel having a first open end for receiving a plunger and a second open end adapted to mount a needle on the opening thereof; and
- a plunger slidably mounted in said barrel, said plunger being withdrawable from said barrel through said first open end and said plunger comprising;
- a. means for receiving a force to move said plunger in or out of said barrel,
- b. an elastomeric piston adapted to form a sliding seal with the inner walls of said barrel, said piston having an upper end and a lower end and a bore therethrough communicating between said upper and lower ends,
- c. a shank joining said means (a) to said piston (b);
- d. an extension of said shank passing through said bore and extending beyond the lower end of said piston, said extension preventing the piston from contacting said barrel second end;
- e. a chamber defined by said second open end of said barrel and the lower end of said piston when said extension is in contact with said second open end;
- f. an inert fluid disposed in said barrel between the second open end thereof and said piston, in a volume in excess of that required to fill said chamber and the bore of said needle;

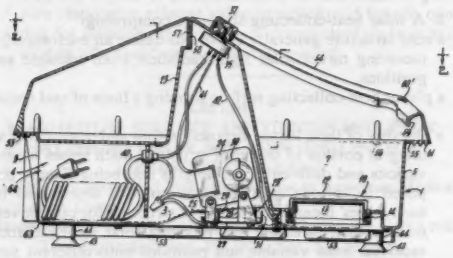
said extension having means thereon to permit the entire surface of said piston lower end being in open communication with the outside of said barrel through said second open end when said extension is in contact with said second open end.

4,057,053

FOOT BATH MASSAGER

Raymond W. Kunz, Monroe, Conn., assignor to Clairol Incorporated, New York, N.Y.

Filed May 4, 1976, Ser. No. 683,129
Int. Cl.² A47K *3/10*; A61H *9/00*
U.S. Cl. 128—25 B **13 Claims**



1. A foot treating unit comprising
- a. a housing including

b. a pair of deck areas having top and bottom surfaces wherein feet are received on the top surfaces, and

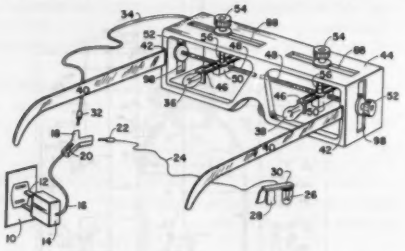
c. massaging means for massaging feet on said deck areas by multi-directional vibration of said deck areas wherein the massaging means includes a vibrator mounted on a centrally located deck coupling means for oscillation on an axis generally transversely of the deck areas and wherein said vibrator is positioned above the top surfaces of said deck areas and is coupled to said deck areas beneath the bottom surfaces of the deck areas.

4,057,054

EYE TREATMENT APPARATUS

Frank C. Giannone, 1416 N. Bridgeport Drive, Mount Prospect, Ill. 60056

Filed May 20, 1976, Ser. No. 688,174
Int. Cl.² A61H 5/00
U.S. Cl. 128—76.5 **5 Claims**



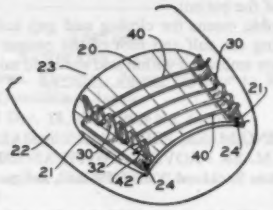
1. Eye treatment apparatus having, in combination, a hollow rectangular housing having at least a horizontal top wall, two vertical end walls and a front portion, two temple pieces connected to said housing and projecting outwardly from said front portion with one temple piece disposed adjacent each end of the housing whereby the housing may be supported on the head of a user with said front portion facing the user's eyes, said front portion having first and second openings, one on each side of the center of said front portion whereby each is generally alined with one of the user's eyes, first and second blocks disposed within said housing and generally alined with said first and second openings respectively, two lamps, means for supporting one of said lamps on said first block to shine through said first opening, means supporting the other of said lamps on said second block to shine through said second opening, means for connecting said lamps to an electrical power supply, said top wall having first and second longitudinal slots disposed respectively alongside said first and second openings, the end wall adjacent said first opening having a first vertical slot and the end wall adjacent said second opening having a second vertical slot, a first vertical threaded element projecting through said first longitudinal slot and threaded into said first block to adjust the vertical position of the first block, a first horizontal threaded member projecting through said first vertical slot and threaded into said first block to adjust the horizontal position of the first block, said two threaded elements constituting the sole means of support of said first block in said housing, a second vertical threaded element and a second horizontal threaded element similarly projecting respectively through said second horizontal and vertical slots and threaded into said second block thereby to constitute the sole support of the second block in said housing and to adjust the vertical and horizontal position of the block, and means operable to maintain the vertical and horizontal positions of said blocks.

4,057,055

TOENAIL APPLIANCE AND METHOD

John H. Clark, 104 Biltmore Ave., Wheeling, W. Va. 26003

Filed Aug. 22, 1975, Ser. No. 607,050
Int. Cl.² A61F 5/00
U.S. Cl. 128—81 A **17 Claims**



1. An apparatus for straightening an incurvated toenail comprising:

a first post member adapted to be secured to only the external surface of such toenail, said first post member having a nail engaging portion and an upstanding portion;

a second post member adapted to be secured to only the external surface of such toenail in spaced opposition to said first post member;

a tension member under stress interconnecting said first post member and said second post member, said tension member being connected to said first post member at said upstanding portion, whereby,

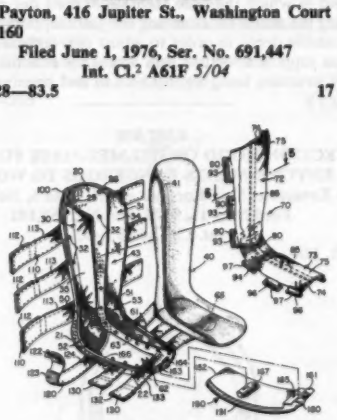
said upstanding portion of said first post member defines a moment arm extending from the surface of such toenail thereby establishing a couple at such toenail providing a rotating force tending to straighten such toenail.

4,057,056

WALKING CAST

Hugh W. Payton, 416 Jupiter St., Washington Court House, Ohio 43160

Filed June 1, 1976, Ser. No. 691,447
Int. Cl.² A61F 5/04
U.S. Cl. 128—83.5 **17 Claims**



1. A walking cast for removable attachment to the lower leg of a patient for immobilization thereof comprising,

a posterior shell of rigid non-bendable material having a contoured shape to receive approximately the posterior third of the calf of the lower leg, the ankle posterior to both malleoli and the ventrum of the entire foot, said shell extending from the upper calf, distally to beneath the lower part of the ankle and the foot, said shell having a shape for rigidly supporting the foot in a predetermined neutral position at substantially right angles to the calf and in proper crosswise relation, the sides of said shell being

manually bendable about the calf to conform to the size and body shape of the individual patient,

pliable side members attached to the sides of said shell and overlying the lateral portions of the leg, ankle and foot with the adjacent edges of said side members being spaced leaving a gap therebetween, said side members being pliable to conform to the contours of the leg, ankle and the foot of the patient,

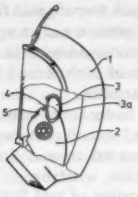
and flexible means for closing said gap and confining and securing the calf and foot of the patient in immobilized position embraced within said shell and said side members.

4,057,057

BREATHING MASK, ESPECIALLY A HALF MASK OR A FULL MASK PROVIDED WITH AN INNER MASK

Sigurd Alfons Backlund, Vaasa, Finland, assignor to Kemira Oy, Finland

Filed Sept. 22, 1975, Ser. No. 615,822
Claims priority, application Finland, Oct. 8, 1974, 742934
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142.4 **4 Claims**



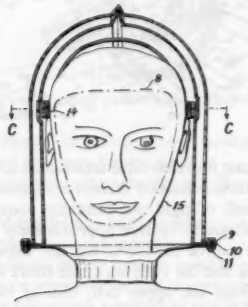
1. A gas mask of the type comprising an outer mask and a separate inner mask having a nose arch and adapted to cover the nose and mouth of a wearer, comprising: a support structure for glasses and means for attaching the support structure directly to the nose arch of the inner mask in order to obtain correct positioning of the glasses in relation to the wearer's face, and in which the nose arch has at least one opening for receiving the means for attaching the glass support structure to an adjustable depth in order to adjust the vertical position of the glass support structure, said means for attaching the glass support structure being tightly held in said opening.

4,057,058

PROTECTION-HOOD OR HELMET-MASK FOR USE IN ENVIRONMENTS DANGEROUS TO WORK

Ostoja Kovacevic, Emil Korsmos vei 24, Oslo 6, Norway

Filed May 11, 1976, Ser. No. 685,141
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142.7 **3 Claims**



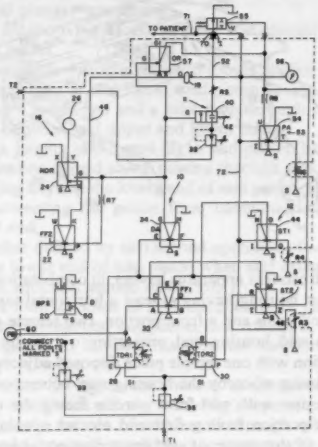
1. A helmet adapted completely to surround the head of the user and having means to seal the helmet to the user's body, the helmet being of double-walled construction comprising a pair of spaced inner and outer walls of stiff material, the inner wall having an opening in front and at least the outer wall being transparent at least where it overlies said opening, partition means extending between the inner and outer walls from the top of the opening of the inner wall rearwardly and downwardly to the bottom of the rear of the helmet, means to supply air to the space between said walls on one side of said partition means, and means to remove air from the space between said walls on the other side of said partition means whereby air passes from said supply means between said walls past said opening and again between said walls to said removing means.

4,057,059

INTERMITTENT POSITIVE PRESSURE BREATHING DEVICE

Karl N. Reid, Jr., Stillwater, Okla.; James Burr Ross, Omaha, Nebr., and Beegamudre N. Murali, Stillwater, Okla., assignors to Oklahoma State University, Stillwater, Okla.

Filed July 29, 1975, Ser. No. 588,870
Int. Cl.[2] A61M 16/00
U.S. Cl. 128—145.8 **19 Claims**



1. A positive pressure ventilator comprising:

a. a source of breathing gas;

b. a normally closed first valve means (40) for directing the breathing gas from said source to the patient;

c. A first bistable means (32) for controlling said first valve means, said first bistable means having a first set of opposed control inputs;

d. a first time delay means (28), and a second time delay means (30), each independently adjustable in time delay;

e. means responsive to said first time delay means to operate one of said first inputs of said first bistable means to open said first valve means, and to trip said second time delay means, and to initiate the inhalation action; and

f. means responsive to the operation of said second time delay means to operate a second one of said first inputs of said first bistable means to close said first valve means and to trip said first time delay means and initiate the exhalation action; and including

g. between said source of breathing gas and said first valve means a pressure controller (38) for maintaining a constant supply pressure to said valve; and

h. between said first valve means and said patient a flow rate control valve (R5);

whereby a selected constant value of flow rate of gas is supplied to said patient when said first valve means is open; and including

non-rebreathing valve means having an open and a closed position, including

i. spring means to open said non-rebreathing valve in the absence of operating pressure, said non-rebreathing valve connected to the supply line of breathing gas for the patient and including

j. fluidic OR gate means for applying pressure to close said non-rebreathing valve during the inbalation phase, and to open said non-rebreathing valve during the exhalation phase.

4,057,060

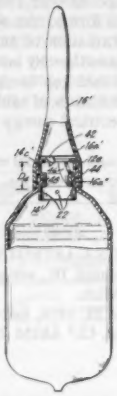
DISPOSABLE MEDICINAL APPLICATION APPARATUS

Richard C. Roth, Milltown, N.J., assignor to Block Drug Company, Inc., Jersey City, N.J.

Filed Nov. 10, 1975, Ser. No. 630,185

Int. Cl.[2] A61M *3/00, 7/02*

U.S. Cl. 128—232 **7 Claims**



1. Apparatus for application of a medicinal fluid, comprising:

sealed bag means at least partially filled with said medicinal fluid;

a neck piece having a first end and having a generally axial bore formed therethrough in communication with said first end, said neck piece being freely enclosed within said sealed bag means and adapted for manipulation of said first end against an interior surface of said bag means;

an applicator member having opposed first and second ends, said applicator member including discharge means at said first end and having a passage between said discharge means and said second end; said applicator member also including means for piercing a wall of said bag means to form an opening therein in communication with said bore of said neck piece;

lockable means formed upon an exterior surface of said neck piece adjacent said first end and comprising at least one channel formed to a selected depth into the exterior surface of said neck piece and extended from said first end of said neck piece;

locking means formed upon an interior surface of said applicator member within said passage and adjacent to said second end and comprising a similar number of lug means radially extending inward into the passage of said applicator member adjacent to said second end; each channel in said neck piece being adapted to slidingly receive an associated lug means and to securely lock said lug means in said channel with a portion of said bag means compressed between said channel and said lug means;

said locking and lockable means being adapted to cooperatively lock said neck piece and said applicator member together with a portion of the wall of said bag means compressed between said neck piece and said applicator member to form a substantially fluid-tight seal;

wherein said lockable means further comprises a recess formed at the end of said neck piece channels furthest from said first end of said neck piece, said recess having a greater depth into said neck piece than the depth of said channel to snaplockingly receive an associated lug means.

4,057,061

SANITARY NAPKIN

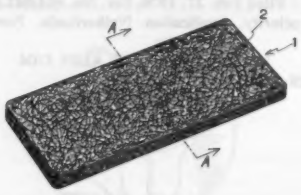
Shigemitsu Ishikawa, Kawanoe, Japan, assignor to Kabushiki Kaisha Angel, Iyomishima, Japan

Filed Dec. 18, 1975, Ser. No. 641,926

Claims priority, application Japan, Dec. 18, 1974, 49-154054[U]; June 28, 1975, 50-90876[U]

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—284 **7 Claims**



1. A sanitary napkin comprising an absorbent core, a fluid-barrier sheet covering at least the bottom surface of said core and a fluid-pervious wrapper enclosing said core and said sheet, said absorbent core being a compressed element which comprises cottony pulp compressed in a compression ratio of $\frac{1}{4}$ to 1/10 to a uniform thickness of about 1 to about 5 mm.

4,057,062

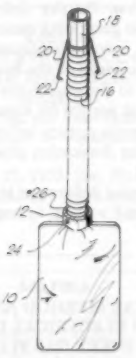
URINARY DEVICE

Geraldine Lavigne, 333 Farview Road, Victoria, British Columbia, Canada (V9C1V7)

Filed Feb. 6, 1976, Ser. No. 655,706

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—295 **8 Claims**



1. A device especially adapted to be employed in conjunction with a container for the collection of urine, comprising an elongated, flexible, hollow collapsable conduit member, said member including a plurality of continuous telescopic members, each having an annular ring, said conduit member having two distal ends, one end of said conduit member including a first annular walled hollow collar, said collar defining at least two recesses on said wall, said collar including internal thread

means, said thread means adapted to engage external thread means of said container, said other distal end including a second hollow collar, said second collar adapted to receive the urine and including a pair of externally projecting arms, said arms having an end portion out of planar alignment with the remainder of said arm, said end portion adapted to engage said recesses when said conduit member is in the collapsed position and thereby maintain the same, said end portions further adapted to engage said annular ring of a single telescopic member whereby the length of said conduit member is adjusted.

4,057,063

DEVICE FOR STERILIZATION BY TRANSUTERINE TUBE COAGULATION

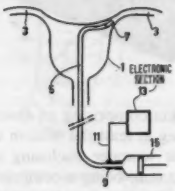
Antonius Cornelis Maria Gieles, and Gerardus Henricus Johannus Somers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,947

Claims priority, application Netherlands, Nov. 4, 1975, 7504321

Int. Cl.² A61B *17/36*; A61N *3/04*

U.S. Cl. 128—303.17 **6 Claims**



1. A device for sterilizing human females by transuterine tube coagulation, comprising:

means for generating a high frequency voltage;

flexible catheter probe means having an electrode end portion dimensioned to completely contact the wall area of a fallopian tube for transuterine placement of said electrode end portion thereof into said fallopian tube of a human female, means including said probe means for coupling said voltage from said means for generating to said electrode end portion, thereby delivering high frequency voltage from said generating means to said fallopian tube;

means for making a common ground connection between said generating means and the human female;

means responsive to the impedance of the tissues adjacent said electrode end portion for signalling when the substantial increase therein occurs indicative of the substantial completion of the dessication phase of the destruction of said tissues; and

means for interrupting delivery of high frequency voltage to said electrode end portion in response to said signalling thereupon.

4,057,064

ELECTROSURGICAL METHOD AND APPARATUS FOR INITIATING AN ELECTRICAL DISCHARGE IN AN INERT GAS FLOW

Charles F. Morrison, Jr., and Benson C. Weaver, both of Boulder, Colo., assignors to Valleylab, Inc., Boulder, Colo.

Filed Jan. 16, 1976, Ser. No. 649,683

Int. Cl.² A61B *17/36*

U.S. Cl. 128—303.17 **27 Claims**

8. Apparatus for establishing an electrical discharge to an object comprising

a support;

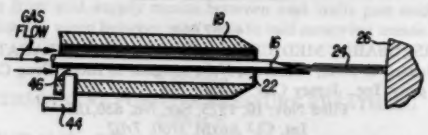
a source of electrical energy;

an active electrode supported by said support and outwardly extending therefrom;

a source of inert gas;

gas flow directing means connected to said source of inert gas for directing the gas past said electrode to thereby facilitate the establishment of a primary electrical discharge to said object in the gas disposed adjacent the end of the electrode and extending outwardly therefrom;

discharge initiating means for initiating said primary electrical discharge, said discharge initiating means including a



second electrode connected to said source of electrical energy and so disposed with respect to said active electrode that a gap is formed therebetween, said gap being adapted for the formation of an auxiliary electrical discharge thereacross to thereby initiate said primary electrical discharge and said gap comprising the only path, at least during the initiation of said auxiliary electrical discharge, for the electrical energy to said active electrode; and

means for returning said electrical energy from said object to said source of electrical energy.

4,057,065

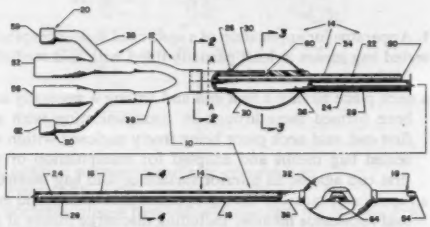
PERCUTANEOUS GASTROINTESTINAL TUBE

G. Bruce Thow, Champaign, Ill., assignor to Dow Corning Corporation, Midland, Mich.

Filed June 21, 1976, Ser. No. 698,397

Int. Cl.² A61M *25/00*

U.S. Cl. 128—348 **1 Claim**



1. A percutaneous gastrointestinal tube for providing intestinal stent plication and separate and independently controllable gastric and intestinal decompression, said tube comprising an elongated elastomeric member, having a distal portion which is surgically insertable through an incision into the patient's stomach and then threadable downward into the intestine and a proximal portion extending from said distal portion and remaining external to the patient's body when in use; said elastomeric member also having

a. a stomach decompression lumen to provide fluid communication between a distal stomach decompression lumen opening in the section of the distal portion which will be in the patient's stomach when said tube is properly disposed in the patient's body, and a proximal stomach decompression lumen opening in said proximal end of said tube;

b. an intestinal decompression lumen to provide fluid communication between a distal intestinal decompression lumen opening disposed at or near the lower distal end of said member and a proximal intestinal decompression lumen opening in the proximal end of said tube;

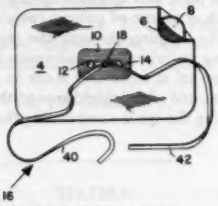
c. an upper inflatable cuff means for retaining and positioning said member adjacent the inner surface of the stomach wall and to help seal the incision at the inner surface of the stomach;
d. an upper cuff inflation-deflation lumen to provide fluid communication between said upper inflatable cuff means and a proximal upper cuff opening disposed in said proximal portion of said tube;
e. a lower inflatable cuff means disposed near the lower distal end of said member, for insertion of said tube into the patient's body to facilitate the threading of said member downward from the stomach into the intestine, said lower cuff means being inflated during a part of the insertion of said tube into the patient's body; and
f. a lower cuff inflation-deflation lumen connecting and providing fluid communication between said lower inflatable cuff means and a proximal lower cuff opening disposed in said proximal portion of said tube.

4,057,066

CATHETER HOLDER FOR SECURING A URETHRAL CATHETER TO A PATIENT

Harry E. Taylor, 22 Taylor Drive, Bradford, Pa. 16701

Filed Sept. 2, 1976, Ser. No. 720,085
Int. Cl.² A61M *25/02*
U.S. Cl. 128—349 R **2 Claims**



1. A catheter holder for securing a urethral catheter to a patient comprising:
a flexible anchoring strip having a pressure-sensitive adhesive layer on one side for securing the anchoring strip to a patient's skin,
a cord secured to the anchoring strip with cord ends extending from the anchoring strip,
said cord ends adapted to be looped around a peripheral groove in a connector between a catheter and a drain tube, and tied to secure the catheter holder to said groove,
said anchoring strip having a pair of openings through which the cord passes and the cord is tied to secure to the anchoring strip,
said anchoring strip having a reinforcing panel to reinforce the anchoring strip in the vicinity of the openings.

4,057,067

ATRIOVENTRICULAR ELECTRODE

Thomas Z. Lajos, 2454 W. Oakfield Road, Grand Island, N.Y. 14072

Filed Apr. 6, 1976, Ser. No. 674,235
Int. Cl.² A61N *1/04*
U.S. Cl. 128—418 **8 Claims**

1. An atrioventricular electrode comprising a common body, a ventricular component extending from said common body as a continuation thereof, said ventricular component terminating remote from said common body in a ventricular electrode tip, an atrial component extending from said common body and normally reversely turning relative to said common body to assume a generally J-shaped configuration, said atrial component terminating remote from said common body in an atrial electrode tip, and releasable means carried cooperatively by said atrial component and said ventricular component for temporarily retaining said atrial component as a generally straight line continuation of said common body and generally parallel to said ventricular component.

4,057,068

ENCLOSURE FOR AND METHOD OF ENCLOSING A BODY IMPLANTABLE PULSE GENERATOR

Richard H. Comben, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 20, 1976, Ser. No. 659,650
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 P **7 Claims**

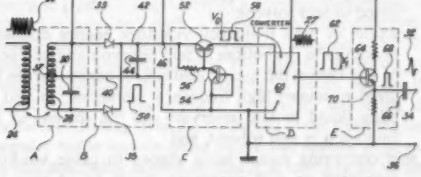
1. In an enclosure for a body implantable pulse generator of the type having a plurality of members weldable to each other to enclose and hermetically seal said pulse generator and having feedthrough means passing through said enclosure, the improvement wherein said plurality of members comprises first and second members each having a continuous side wall terminating at continuous generally circular means of substantially equal diameter, at least one of said side walls including platform means subtending a portion of the arc of said circular means and web means extending between said platform means and said subtended arc portion of said circular means, and said feedthrough means passing through at least one of said platform means and web means.

4,057,069

METHOD OF NERVE STIMULATION AND A STIMULATOR FOR THE APPLICATION OF THE METHOD

Auguste Dorffer, Grenoble, and Jean-François Piquard, Vizille, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 25, 1975, Ser. No. 607,688
Claims priority, application France, Aug. 30, 1974, 74.29645
Int. Cl.² A61N *1/36*
U.S. Cl. 128—421 **8 Claims**



1. A method for electric excitation of living cells by means of an electromagnetically inductive receiver implanted in a living

body and equipped with output electrodes, comprising the steps of:

producing an alternating electromagnetic induction field at the location of said receiver of a frequency variable about a reference frequency f_0 by means of a transmitter external to said body operated at a frequency f so set and for a period so selected that the requency difference $f-f_0$ corresponds to a desired amplitude of a cell excitation pulse and the selected period corresponds to a desired cell excitation pulse duration, and repeating said field producing step at predetermined intervals to the extent further cell excitation is desired;

detecting said induction field in said receiver to collect energy therefrom for operating said receiver, and

detecting in said receiver the extent of said frequency difference $f-f_0$ of said induction field and producing in response thereto at said output electrodes a cell excitation signal of an amplitude corresponding to said frequency difference $f-f_0$ and of a duration determined by said selected period.

4,057,070

CLEANING APPARATUS FOR MECHANICAL WORKPIECES

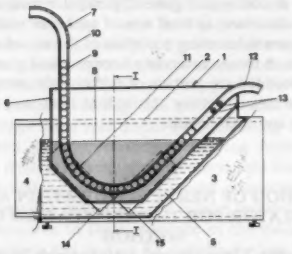
Evert van Amerongen, Bennekom, and Willem M. Buhrman, Leusden, both of Netherlands, assignors to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed May 20, 1976, Ser. No. 688,370

Claims priority, application Netherlands, May 21, 1975, 7505936

Int. Cl.² B08B *3/12*

U.S. Cl. 134—83 **15 Claims**



1. A cleaning apparatus comprising:

a reservoir adapted to contain a solvent for cleaning workpieces;

a coupling liquid disposed in contact with said reservoir at the exterior thereof;

conveying means arranged to cause a portion thereof to be disposed in said reservoir for contact with said solvent and causing workpieces supported by said portion to be exposed to said solvent;

a source of high frequency vibratory energy disposed in proximity to the bottom of said reservoir and said portion of said conveying means, said source adapted when energized to impart high frequency vibrations via said coupling liquid to said reservoir and the solvent to cause cavitation in said solvent, and

said conveying means being shaped to cause workpieces supported on said conveying means to advance themselves along said conveying means responsive solely to the combined action of gravity and cavitation produced in said solvent.

4,057,071

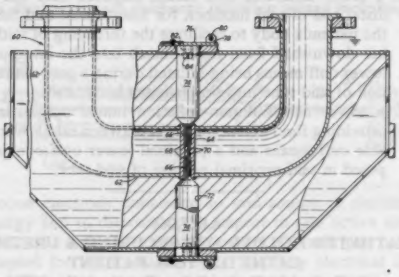
ELECTROSTATIC CHARGE REDUCER

Donald F. Rhodes, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 431,901, Jan. 9, 1974, abandoned. This application Aug. 24, 1976, Ser. No. 717,452

Int. Cl.² H05F *3/06*

U.S. Cl. 137—1 **12 Claims**



1. Apparatus for reducing electrostatic charge on a nonconductive and flammable liquid flowing through pipe for delivery into a tank comprising a metallic cylinder secured to the pipe and extending through the wall of the pipe into the opening through the pipe, said cylinder having a wall thickness of at least 1/8 inch, a source of gamma radiation in the cylinder positioned in the opening through the pipe, the quantity of source of gamma radiation being adequate to impart a dose of gamma radiation of at least 1.75 Rads to the liquid flowing through the pipe, and a lead shield around the pipe adjacent the cylinder shielding the space surrounding the pipe from gamma radiation.

4,057,072

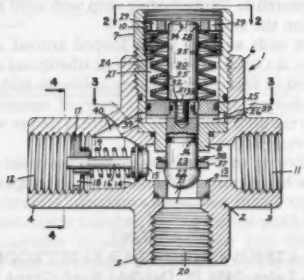
UNLOADER VALVE

James E. Cook, 418 Rice St., Anoka, Minn. 55303

Filed Mar. 4, 1976, Ser. No. 663,758

Int. Cl.² F16K *17/04*

U.S. Cl. 137—116 **3 Claims**



1. An unloader valve comprising:

a. valve housing means having aligned inlet and outlet ports and defining a straight-through first passageway connecting said ports;

b. a one-way outlet check valve in said first passageway adjacent said outlet port;

c. said housing means further defining, a bypass port, a second passageway connecting said bypass port with said first passageway, a valve seat at one end of said second passageway and at one side of said first passageway, and a cylindrical chamber axially aligned with said valve seat;

d. a piston in said chamber dividing the chamber into an inner pressure chamber portion and an outer chamber portion open to the exterior of said housing means;

e. said housing means further defining, an opening between said pressure chamber portion and said first passageway, and a third passageway communicating at one end with said first passageway between said outlet port and said check valve and at its other end with said pressure chamber portion;

f. a bypass valve element disposed in said first passageway and having a stem extending through said opening and connected to said piston, said bypass valve element being movable with said piston toward and away from valve closing engagement with said valve seat;

g. yielding means in said outer chamber portion yieldingly urging said piston and said bypass valve element in a valve closing direction, said yielding means comprising a plurality of resilient conical washers arranged in axial pairs to provide a stack of said washers, the washers of each pair having concave sides in face-to-face relationship; and

h. a conical washer mounted on said bypass valve element stem and positioned to engage said housing means to cushion said bypass valve element during opening movement thereof.

4,057,073

PLURAL-SERVICE HYDRAULIC SYSTEM

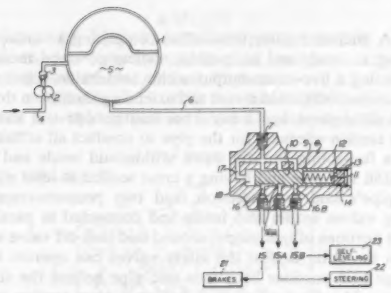
Frederick John Adams, Campton, England, assignor to Cam Gears Limited, Hitchin, England

Division of Ser. No. 475,119, May 31, 1974, Pat. No. 4,014,360. This application Aug. 16, 1976, Ser. No. 714,596

Claims priority, application United Kingdom, May 31, 1973, 25891/73

Int. Cl.² G05D *11/02*

U.S. Cl. 137—118 **6 Claims**



1. A vehicle hydraulic system comprising:

hydraulic brake means;

at least two other hydraulic means which, in operation, reduce the availability of hydraulic pressure to said brake means;

a hydraulic fluid source for providing a supply of hydraulic fluid; and,

flow control means for controlling fluid flow from said source to said at least two other hydraulic means and including valve means responsive solely to the pressure of said hyraulic fluid immediately upstream of said valve for blocking flow communication with at least one of said at least two other hydraulic means when said pressure upstream of said valve falls below a selected level so as to thereby prevent further reduction of said hydraulic pressure due to said at least one of said at least two other hydraulic means, and including means for blocking flow to said at least two other hydraulic means one after another in sequence of priority in response to continued decreases in the level of said pressure of said hydraulic fluid upstream of said valve.

4,057,074

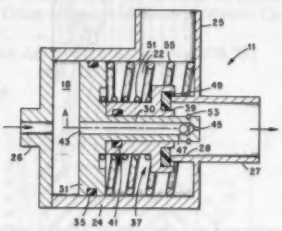
BIDIRECTIONAL PISTON VALVE

Harry C. Fischer, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 24, 1976, Ser. No. 717,431

Int. Cl.² G05D *7/00*

U.S. Cl. 137—107 **5 Claims**



1. A valve comprising:

a housing provided with an inlet port and an outlet port having a common axis and also provided with an inlet-outlet port defining a valve seat,

a piston slidably fitted in said housing for movement along said axis and partitioning said housing into a first compartment including said inlet port and a second compartment including said outlet port and valve seat, the head of said piston confronting said inlet port and being formed with an axial passage communicating with a discharge port in the sidewall of the stem of said piston,

a valve disc assembly carried by said piston, said assembly including a hub portion slidably engaging said stem and including a disc for sealably engaging said seat,

means carried by said piston for resiliently biasing said disc assembly outwardly away from the piston head and

means carried by said piston for limiting the outward movement of said disc assembly to a position where said hub portion sealably covers said discharge port, whereby admission to said inlet port of fluid at a selected pressure moves said piston toward said seat to a position where engagement of said disc assembly and said seat displaces said disc assembly inwardly along said stem and uncovers said discharge port.

4,057,075

SEPARATOR, ESPECIALLY FOR CHIMNEYS

Edgar Muschelknautz, Leverkusen; Armin Bürkholz; Hermann Wieschen, both of Cologne; Hans Guth, Berg.Neukirchen, and Wolfgang Richter, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Levekusen, Germany

Continuation of Ser. No. 487,321, July 10, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,478

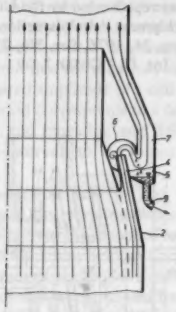
Claims priority, application Germany, Aug. 1, 1973, 2338913

Int. Cl.² B01D *45/00; 137 171;173*

U.S. Cl. 137—171 **9 Claims**

1. Apparatus for separating liquid films, droplets, and sprays contained in pipe borne gas flow of a chimney comprising: an upright pipe provided with a cross sectional construction adapted to accelerate the gas-liquid flow in the pipe, an annular stripping slot at the periphery of the pipe for receiving the accelerated gas-liquid flow and having an outlet end for the gas-liquid flow, an annular baffle surface for deflecting the gas-liquid flow issuing from the outlet end of the stripping slot, the annular baffle surface being above and spaced from said outlet end and being arched so that it is concave as viewed from said outlet end, an annular collecting trap having a liquid outlet and an annular gas outlet opening for receiving the deflected gas-liquid flow, an annular gas outlet channel extending upwardly from the annular gas outlet opening of the col-

lecting trap and leading from the collecting trap to the pipe above the stripping slot for flow of the gas from the collecting



trap upwardly and into the pipe, the liquid outlet of the collecting trap being disposed below tha annular baffle.

4,057,076

WASTE WATER VALVE

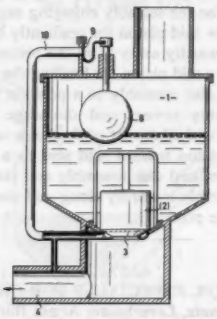
Martti Varis, Kalkkipellonmaki A 3, 02600 Leppavaara, and Krister Nordberg, Hietalahdenkatu 7 A, 00180 Helsinki 18, both of Finland

Continuation of Ser. No. 516,880, Oct. 21, 1974, abandoned. This application May 13, 1976, Ser. No. 686,799

Claims priority, application Finland, Oct. 26, 1973, 733324

Int. Cl.[2] F16K *31/34*

U.S. Cl. 137—413 **1 Claim**



1. A waste water valve arrangement connectable to a vacuum sewage disposal system the function of which is based on a partial vacuum being upheld therein, said arrangement comprising a waste water collecting chamber having a waste-water inlet; a closure member normally closing an outlet passage forming a connection between said collecting chamber and said vacuum sewage disposal system; a pressure controlled operating device for displacing said closure member by means of a pressure difference available from the atmosphere and said partial vacuum of said sewage disposal system; a float displaced by liquid level variations in said collecting chamber; and a pilot valve controlled by said float, said pilot valve controlling said operating device, said operating device being constantly connected with said partial vacuum of said sewage disposal system and being free of operating elements moving in openings through partitions between spaces under different pressure, said pilot valve being arranged to control said operating device by varying the vacuum therein so as to obtain pressure changes for displacing said closure member to open said connection between said collecting chamber and said sewage disposal system; said closure member being buoyant in the liquid received by said collecting chamber, said partial vacuum of said sewage disposal system being arranged to act on the underside of said closure member, thereby preventing it from floating upwards, said pilot valve having duct means connected to a portion of said underside of the closure member, said pilot valve admitting atmospheric pressure into said duct means when said float is at a predetermined upper level in said collecting chamber for producing an increased pressure at said portion of said underside of the closure member, thereby allowing said closure member to free itself and to float upwards.

4,057,077

NUCLEAR REACTOR STEAM GENERATOR INSTALLATION

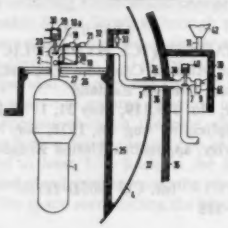
Hans-Peter Schabert, Erlangen, and Erwin Laurer, Mohrendorf, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed June 26, 1975, Ser. No. 590,673

Claims priority, application Germany, June 26, 1974, 2430586

Int. Cl.[2] E03B *11/00*; G21C *19/20*

U.S. Cl. 137—861 **4 Claims**



1. A nuclear reactor installation comprising a containment having an inside and an outside, nuclear-powered means for producing a live-steam output within said inside, a live-steam pipe connected to said means and extending therefrom through said containment and away from said outside and having a cross section adequate for the pipe to conduct all of said output, a fast-acting shut-off valve within said inside and interposed in said pipe and having a cross section at least equal to the pipe's said cross section, and two pressure-responsive safety valves within said inside and connected in parallel to shunt portions of said output around said shut-off valve so that when the latter is shut the safety valves can operate to discharge said portions back into said pipe behind the shut-off valve, said safety valves each having a cross section smaller than that of said shut-off valve and being normally-closed and opening in response to respectively different steam pressures in said pipe ahead of the shut-off valve.

4,057,078

VACUUM SLIDE VALVE

Robert J. Albrecht, River Edge, and Martin J. Fraunberger, Mahwah, both of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

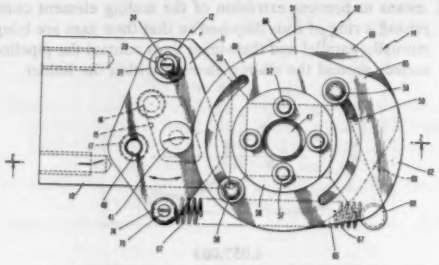
Filed Mar. 4, 1976, Ser. No. 663,767

Int. Cl.[2] F16K *11/06*

U.S. Cl. 137—625.2 **4 Claims**

1. A vacuum valve comprising in combination, a first stationary metallic plate member, a second moveable plate member formed of an oil impregnated metallic substance lying on said first plate member, the contacting surfaces of said first and second plate members being smooth and flat, means for pivoting said moveable plate member at one end thereof to said stationary plate member, bores in said stationary plate member being provided with means for connection to a vacuum source and vacuum utilizing mechanism respectively, means providing a recess in said moveable plate member extending inwardly

thereof from said contacting surface thereof, a cam follower roller mounted on said moveable plate member, cam wheel means mounted on said stationary plate member parallel to said moveable plate member for cooperating with said cam follower roller, spring means acting upon said moveable plate member to hold the cam follower roller against the outer surface of said cam wheel, said cam wheel being formed to slide said second plate member upon said first plate member between a first position and a second position and means providing a third bore extending through said moveable plate member, said first bore being located to be in fluid flow communication with said recess in both said first and second positions to maintain a vacuum in said recess at all times, said second bore being in communication with said recess in said first position to provide a vacuum at the vacuum utilizing mechanism and being in communication with said third bore in said second position to relieve the vacuum at the vacuum utilizing mechanism.



4,057,079

POWER ASSISTANCE CONTROL DEVICE

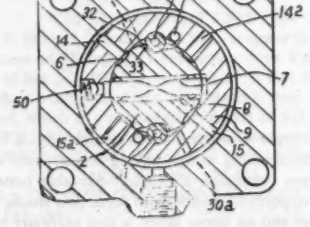
Alistair Gordon Taig, Bristol, England, assignor to Bendix-Westinghouse Limited, Bristol, England

Filed Mar. 15, 1976, Ser. No. 666,836

Claims priority, application United Kingdom, Apr. 15, 1975, 15332/75

Int. Cl.² F15B 9/08

U.S. Cl. 137—625.23 **7 Claims**



1. A fluid power assistance control device including a rotatable force input member, a first valve member coupled to said force input member for rotation therewith, and a second valve member rotatable relative to said first valve member, one of said first and second valve members having at least one projection projecting into the other of said first and second valve members to limit the rotation between said first and second valve members, said projection cooperating with said first and second valve members to substantially define two fluid flow paths, said fluid flow paths communicating with an outlet port and said projection forming fluid flow restrictions within said fluid flow paths such that relative rotation between said first and second valve members increases the fluid flow restriction in one of said two fluid flow paths and decreases the fluid flow restriction in the other of said two fluid flow paths, said first and second valve members cooperating to substantially define reaction cavities which communicate with respective fluid flow paths such that fluid communicated to one of said reaction cavities opposes the rotation of said force input member.

4,057,080

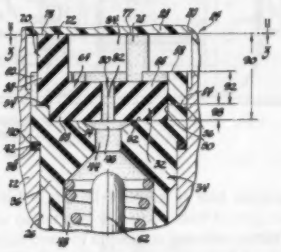
FLUID FLOW CONTROL MEMBERS

James R. Baber, Miamisburg, and Ronald J. Dershem, Trotwood, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 14, 1976, Ser. No. 676,753

Int. Cl.² F15D 1/02

U.S. Cl. 138—44 **4 Claims**



1. A fluid flow controlling orifice body and seat unit arranged to prevent inadvertent axially reversed mis-assembly of the orifice body into the seat;

said orifice body having a disc-like main body section with an upper portion and a lower portion and an orifice aperture extending axially therethrough, and a leg portion defined by at least three circumferentially spaced legs extending axially away from said upper portion on the side thereof away from said lower portion and parallel to the axis of said aperture, the space circumferentially and diametrically and chordally between said legs and axially beyond said main body section being open, said upper portion having a first outer diameter, said lower portion having a second outer diameter, and the radially outer edges of said leg portion lying on a circle having a third diameter, one of said diameters being equal to another of said diameters and the remaining diameter being substantially unequal to said one diameter, said second diameter being less than at least one of said first and third diameters;

said seat having a cylindrically formed bore including an orifice body receiving section and a bore side wall, said receiving section having first shoulder means defining an annular seat for abutting engagement with said orifice body lower portion, second shoulder means having at least portions thereof circumferentially spaced radially outwardly and axially spaced relative to said first shoulder means for abutting engagement with another of said orifice body portions, and an annular end surface adjacent to but axially spaced from said second shoulder means, said bore side wall circumferentially surrounding at least an axial portion of said open space between said legs of said orifice body when said orifice body is received by said seat to define a flow chamber fluid connected with said orifice aperture and positioned axially adjacent to said orifice body main body section;

the overall axial length of said orifice body being greater than the axial length of said seat bore orifice body-receiving section from said second shoulder means to said end surface whereby an axially reversed mis-assembly of the orifice body into the seat results in an overall axial length of said orifice body and seat greater than the overall axial length thereof when properly assembled.

4,057,081

PIPELINE PIGS

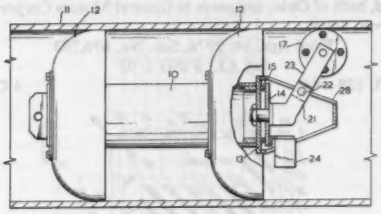
Trevor Clifford Jones, Stroud, England, assignor to Underground Location Services Limited, Stonehouse, England

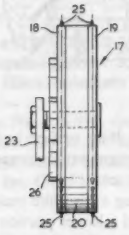
Filed Apr. 6, 1976, Ser. No. 674,737

Claims priority, application United Kingdom, Apr. 9, 1975, 14562/75

Int. Cl.[2] F16L *55/12;* **G01R** *19/00*

U.S. Cl. 138—97 **9 Claims**





1. A magnetically detectable attachment for a pipeline pig comprising a wheel formed from two circular plates of magnetic material spaced apart for rotation on a common axis, means for producing a magnetomotive force between the rims of said circular plates and means for rotatably mounting the wheel on a pig with its axis of rotation perpendicular to the longitudinal axis of the pig so that, in use, it rolls along with the peripheries of the two discs in contact with the inner surface of a pipe wall.

4,057,082

PIPELINES

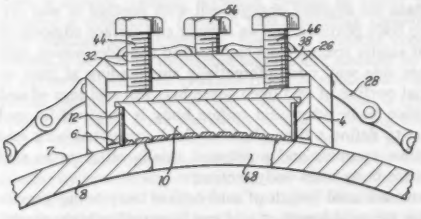
Robert Paul King, Bagshot, England, assignor to The British Petroleum Company Limited, Middlesex, England

Filed June 2, 1976, Ser. No. 692,232

Claims priority, application United Kingdom, June 5, 1975, 24260/75

Int. Cl.[2] F16L *55/16;* **A44B** *21/00;* **B65D** *63/00;* **F16J** *15/12*

U.S. Cl. 138—99 **2 Claims**



1. An apparatus for the repair of a pipeline having a hole in the wall thereof and suitable for withstanding an internal pipeline pressure of up to 3000 psi comprising:

a. a compressible sealing element;

b. a holder for holding the sealing element against the outer surface of the wall of the pipeline;

c. means for applying pressure to the sealing element radially inwardly with respect to the pipeline to compress the sealing element against the surface thereof around the hole and for maintaining the holder on the pipeline against the reaction of the applied pressure comprising an elongate flexible member to be placed around the pipeline and holder and capable of being tensioned and means for applying tension to the elongate flexible member; and

d. means to prevent extrusion of the sealing element comprising a ring of rods disposed so that their axes are lying mutually parallel and their inner ends contact the pipeline surface around the sealing element within the holder.

4,057,083

DOUBLE-LAYER WEAVING LOOM

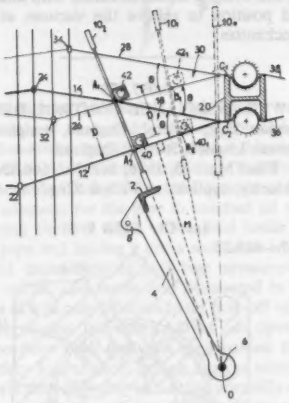
Yves Juillard, and Victor Riner, both of Mulhouse, France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse Cedex, France

Filed Aug. 31, 1976, Ser. No. 719,333

Claims priority, application France, Sept. 5, 1975, 75.27246

Int. Cl.[2] D03D *41/00*

U.S. Cl. 139—20 **5 Claims**



1. A multiple shuttleless loom comprising: a breast beam, double shed forming means having healds with warp thread guiding eyes vertically, alternately-movable between lowermost and uppermost positions to form two sheds, each with a lower layer and an upper layer, a sley pivotally mounted for rocking movement on a transverse horizontal axis, a reed secured to said sley for corresponding rocking movement together therewith between an extreme rear position and an extreme fore position through an intermediate position, reciprocating weft thread inserting needles supported by said sley for inserting weft thread into said sheds, said needles beginning entry into the sheds upon said reed passing through said intermediate position during the rearward movement thereof, said lower layers having segments located between said extreme rear position and said intermediate position of said reed, said loom being characterized in that said lowermost positions of said heald eyes are so located with respect to said breast beam that center-lines normal to said segments of said lower layers pass substantailly through said pivotal axis of said sley.

4,057,084

JACQUARD-HARNESS OF A WEAVING MACHINE

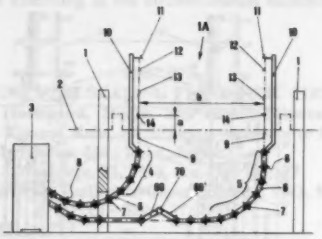
Otto Müller, Utikon am See, Switzerland, assignor to Stäuble Ltd., Horgen-Zurich, Switzerland

Filed June 7, 1976, Ser. No. 693,549

Claims priority, application Switzerland, June 12, 1975, 7595/75

Int. Cl.[2] D03C *3/00, 3/38*

U.S. Cl. 139—59 8 Claims



1. In a harness of a weaving machine having heddles and a movable harness therein, wherein the spacing of the heddles are movable and adjustable preferable in the width of the machine to facilitiate an adjustment of the width of the selected material, wherein the movable harness has in the path of the harness cords a plurality of series arranged and spaced comber boards which are arranged one behind the other and having a guide bore per harness cord therein, the improvement comprising a connection between each pair of series arranged comber boards which consists of at least one rigid, namely bend-resistant connecting rod which is pivotally interconnected through a pivotal joint connection to an adjacent connecting rod, said pivotal joint being located adjacent each of the comber boards so that a center line of each comber board coincides with the pivot axis of the pivotal joint connection, each of the comber boards having a plurality of guide bores therein which are series arranged and have a harness cord extending therethrough with the guide bores in alternating ones of said comber boards having a mirror image relationship to the bores in the next adjacent comber board said guide bores in each of said comber boards being symmetrical to a plane connecting the center lines of the comber boards.

4,057,085

VAPOR RECOVERY SYSTEM

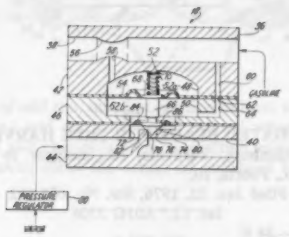
Marwan S. Shihabi, Northridge, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 606,312, Aug. 20, 1975, Pat. No. 4,020,861, which is a division of Ser. No. 494,391, Aug. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 439,225, Feb. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 429,555, Jan. 2, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,462

Int. Cl.[2] B65B *31/04;* B67D *5/04;* G05D *11/02*

U.S. Cl. 141—59 1 Claim

1. A system for simultaneous gasoline delivery and gasoline vapor recovery, said system comprising: a gasoline storage tank having a gasoline outlet and a gasoline vapor inlet; a control apparatus including a first passage having a venturi, a low pressure port, at said venturi and a high pressure port in said just passage adjacent said low pressure port, a gasoline inlet, a gasoline outlet, a gasoline vapor inlet and a gasoline vapor outlet, said control apparatus gasoline outlet being in communication with said control apparatus gasoline inlet through said first passage and said venturi, said control apparatus also including a diaphragm valve in a second passage connecting said control apparatus gasoline vapor inlet and said control apparatus gasoline vapor outlet to control the amount of gasoline vapor flowing through said control apparatus gasoline vapor outlet, said diaphragm valve including a diaphragm, means forming first and second cavities on opposite sides of said diaphragm, first and second conduit means connecting said first and second cavities, respectively, directly to said low and high pressure ports, respectively, said diaphragm valve opening and closing in response to an increase and decrease in the difference between the pressures in said ports; means connected from said storage tank gasoline outlet to said control apparatus gasoline inlet to supply gasoline under pressure thereto thereat; a blower connected from said control apparatus gasoline vapor outlet to said storage tank gasoline vapor



inlet to establish a partial vacuum at said control apparatus gasoline vapor outlet; a delivery conduit having one end connected from said control apparatus gasoline outlet and having a dispenser at its other end; a return conduit having an intake end, and another end connected to said control apparatus gasoline vapor inlet; and means to hold said dispenser and said return conduit intake end adjacent one another to provide recovery of gasoline vapor through said return conduit intake end during gasoline discharge through said dispenser and means for shutting off flow vapor through said second passage when flow of gasoline through said first passage ceases.

4,057,086

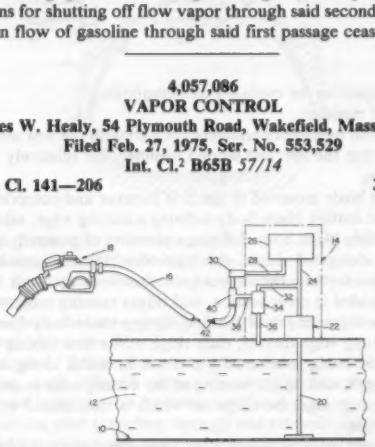
VAPOR CONTROL

James W. Healy, 54 Plymouth Road, Wakefield, Mass. 01880

Filed Feb. 27, 1975, Ser. No. 553,529

Int. Cl.[2] B65B *57/14*

U.S. Cl. 141—206 3 Claims



1. In a liquid dispensing nozzle comprising a body having an inlet and an outlet and defining a liquid conduit therebetween, said outlet defining a spout insertable into a container, a valve in said conduit controlling the flow of liquid from said inlet to said outlet, said valve biased toward a closed configuration, a manual valve operator for opening said valve, and means for releasably retaining said valve operator in an orientation which holds said valve open and for automatically releasing said valve operator in response to either of two conditions in said container, said conditions being buildup of vapor pressure to a predetermined vapor pressure and liquid reaching a predetermined level, the improvement wherein said means comprise a release unit biased to a neutral position in the absence of either of said conditions in said container, and movable, in response to said conditions, to first and second positions which are in

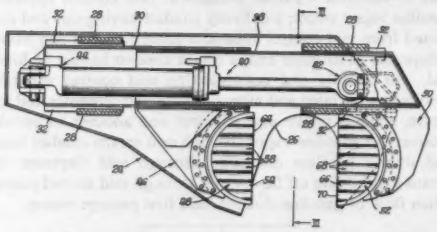
opposite directions from said neutral position, a movable member secured to said valve operator, and retainer means disposed intermediate said release unit and said movable member, said release unit in said neutral position forcing said retainer means into engagement with said movable member to prevent movement thereof, but in said first and second positions releasing said retainer means.

4,057,087

CORRUGATED BLADE FOR TREE HARVESTER

Dorrance Oldenburg, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 22, 1976, Ser. No. 651,492
Int. Cl.² A01G *2308*
U.S. Cl. 144—34 E **6 Claims**



1. Apparatus for cutting a tree comprising:

a first member;

a second member operatively coupled with the first member so that the first and second members are relatively movable;

a first blade mounted to the first member and comprising a first cutting blade body defining a cutting edge, said first cutting blade body defining a plurality of generally parallel elongated ridges, the tops of which are rounded in cross-section, the depressions therebetween each being rounded in cross-section, said ridges running substantially the entire length of the first cutting blade body from the cutting edge thereof, each ridge of the first cutting blade body being substantially uniform in width along its full length, said ridges running to the cutting edge to define a cutting edge the shape of which is determined by said ridges;

a second blade mounted to the second member and comprising a second cutting blade body defining a cutting edge, said second cutting blade body defining a plurality of generally parallel elongated ridges, the tops of which are rounded in cross-section, the depressions therebetween each being rounded in cross-section, said ridges running substantially the entire length of the second cutting blade body from the cutting edge thereof, each ridge of the second cutting blade body being substantially uniform in width along its full length, said ridges running to the cutting edge to define a cutting edge the shape of which is determined by said ridges;

the apparatus being positionable so that a tree may be disposed between the first and second blades; and,

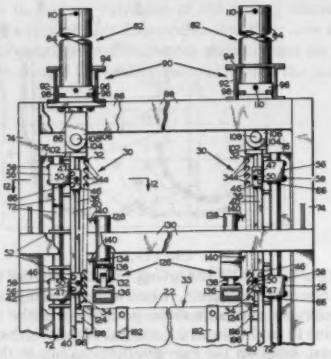
means for selectively relatively moving the first and second members to bring the blades into contact with a tree positioned therebetween to cut such relatively positioned tree.

4,057,088

APPARATUS FOR FORMING SERRATIONS IN OPPOSED EDGES OF WOODEN PANELS FOR USE IN I-BEAMS

Donald Ralph Gross, Emmett; Nick Lewis Schaefer, Boise; John Raymond Russell, Boise, and Clifford Ray Johnson, Boise, all of Idaho, assignors to Trus Joist Corporation, Boise, Idaho

Filed Aug. 27, 1976, Ser. No. 718,352
Int. Cl.² B27F *1/06*
U.S. Cl. 144—91 **15 Claims**



1. An apparatus for forming serrations in opposed edges of wooden panels comprisng;

a. anvils arranged for supporting a stack of the panels in the apparatus and having serrated margins located inwardly adjacent to the edges of the stack,

b. two spaced sets of broaches having cutting faces defining the pattern of the serrations, one being mounted in the apparatus above each anvil margin and movable horizontally with respect thereto,

c. said sets of broaches being tapered and having lower portions which are spaced apart by a distance which is substantially equal to the width of the stacks, and being arranged for cutting the serrations simultaneously in both edges of the panels when forced therepast.

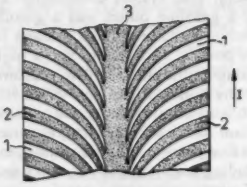
d. actuation means connected to the broaches and arranged for translating them between raised positions wherein their lower portions are above the stack and lowered positions wherein their upper portions are below the stack for simultaneously forming the serrations in both edges of the panels.

4,057,089

PNEUMATIC TIRE FOR MOTOR VEHICLES

Peter Johannsen, Hannover, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Nov. 20, 1975, Ser. No. 633,981
Claims priority, application Germany, Nov. 21, 1974, 2455130
Int. Cl.² B60C *11/06*
U.S. Cl. 152—209 R **4 Claims**



1. A pneumatic tire for high speed motor vehicles upon hard road surfacing, which has a circumferential tread surface with

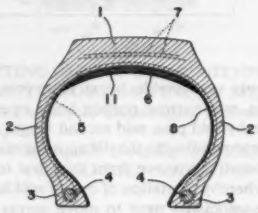
a circumferential central section, said tread surface to protect against danger of hydroplaning being provided with grooves therein extending from said central section toward both sides of said tread surface and said grooves being curved along structural curvature of a parabola of the second order and being provided instantaneously to eliminate water effectively from said tread surface, the structural curvature of said grooves being determined mathematically by a functional equation $x = y^2 x$ constant, in which x is the coordinate extending in the axial direction of said tire, and in which y is the coordinate extending in the circumferential direction of said tire.

4,057,090

PUNCTURE SEALING PNEUMATIC TIRE

Katuyuki Hoshikawa, Honjo; Soji Noda, Takarazuka, and Akitaka Kimura, Kobe, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Sept. 21, 1976, Ser. No. 725,177
Claims priority, application Japan, Dec. 11, 1975, 50-148121
Int. Cl.² B60C *21/08, 5/14*
U.S. Cl. 152—347 **2 Claims**



1. A puncture sealing pneumatic tire comprising in combination a carcass constituted by at least one cord layer, a hard rubber tread portion and sidewalls superimposed on said carcass, at least one breaker layer, rubber inner lining impermeable to air, and a puncture sealing layer which is applied on the inner surface of said inner lining, extends at least over an area corresponding to the area of said tread portion, and has a composition including polybutene, polyisobutylene, silicic anhydride of 5–40 parts by weight to 100 parts by weight of polybutene having a silicic acid content of at least 99% and displaying a loss on drying not exceeding 1.5%, and powdered elastomer material having a particle size distribution in the range of from 5 to 30 mesh sieve size, said polyisobutylene, said silicic anhydride, and said powdered elastomer material being respectively included in the range of from 40 to 150 parts by weight, in the range of from 5 to 30 parts by weight, and in the range of from 25 to 90 parts by weight to each of 100 parts by weight of said polybutene, whereby said puncture sealing material has a viscosity value in the range of from 2.0 to 4.5 and an adhesivity value of at least 100.

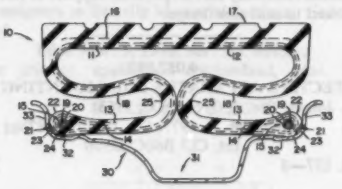
4,057,091

PNEUMATIC TIRE

James Dennis Gardner, Akron, and Robert William Glasscock, Canal Fulton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 7, 1976, Ser. No. 674,710
Int. Cl.² B60C *5/12, 15/00*
U.S. Cl. 152—353 R **9 Claims**

1. In combination a pneumatic tire and rim wherein the rim is comprised of an annular drop center area bounded axially outwardly on either side by annular rim base sections which are in turn bounded axially outwardly by annular rim flanges, said tire is comprised of an annular road-engaging tread, sidewalls connecting the lateral edges of said tread to bead areas which contain annular bead bundles, said tire in a first position when mounted on said rim and uninflated having its bead areas and lower sidewall areas extending axially inwardly from each rim flange in a direction substantially parallel to the axis of rotation of said rim and said sidewalls folded upon themselves to form annular re-entrant walls, said tire in a second position when mounted on said rim and inflated having its bead areas and lower sidewall areas substantially perpendicular to the axis



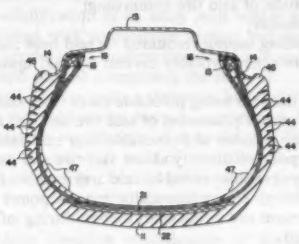
of rotation of said rim, said first position utilized when said tire is stored and said second position utilized when said tire is operational, said change in position resulting from a rotation of said bead areas about the center of said bead bundles upon inflation.

4,057,092

PNEUMATIC TIRE FOR USE WHEN DEFLATED

Frank R. Tracy, Wellington, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 589,223, June 23, 1975, abandoned. This application Mar. 12, 1976, Ser. No. 666,515
Int. Cl.² B60C *17/00, 15/00, 13/00*
U.S. Cl. 152—379.1 **2 Claims**



1. A pneumatic tire to be mounted on a wheel rim having opposed annular flanges comprising:

a. a tread portion extending circumferentially around the tire;

b. two annular rim-engaging bead portions having bead rings embedded therein;

c. a pair of flexible sidewall portions along the sides of the tire, each sidewall portion connecting one edge of the tread portion with the associated bead portion;

d. carcass plies extending through said sidewall portions and folded around said bead rings so that the end portions of said plies are located in said sidewall portions;

e. a thick circumferential lug located on each sidewall portion externally of said carcass plies and end portions thereof, said circumferential lug protruding axially outwardly and radially inwardly from said carcass plies adjacent to the bead portion and providing locking means for projecting beyond the rim flange when the tire is inflated and for hooking around the end of the flange when the tire is underinflated; and

f. each said sidewall portion having an annular thickened section located externally of said carcass plies and end portions thereof, said annular thickened section having its thickest part located adjacent to said circumferential lug and tapering to a thinner part adjacent the middle of said sidewall portion, said annular thickened section also having a plurality of concentric circumferential slots in its external surface, said slots extending inwardly to a depth

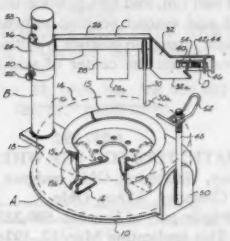
of approximately one-third to two-thirds of the distance between said external surface and said carcass plies, so that said thickened sidewall portion is relatively flexible when said tire is inflated, but when said tire is deflated, said slots close to cause said thickened sidewall portion to become relatively stiff to provide support to hold said lug hooked to said rim flange.

4,057,093

PROTECTIVE APPARATUS FOR MOUNTING TIRES

John S. Joines, Rte. 3, Greer, S.C. 29651

Filed Feb. 9, 1977, Ser. No. 766,887
Int. Cl.² B60C *25/00*
U.S. Cl. 157—1 **10 Claims**



9. A safety and protective apparatus for use in mounting a tire on a multi-piece rim assembly to prevent rim escapement during inflation of said tire comprising:

a base member;

an upstanding support mounted on said base member;

an arm member pivotably carried by said upstanding support;

said arm member being pivotable away from said base member to permit placement of said tire and rim assembly on said base member and pivotable over said base to a superposed position directly above said tire and rim;

engagement means carried by said arm member for engaging said rim at circumferentially spaced points to prevent escapement and flying apart thereof during inflation of the tire; and

releasable lock means carried by said base member for locking the free end of said arm member in a hold-down position when said arm member is in said superposed position.

4,057,094

CAR WINDOW SCREEN

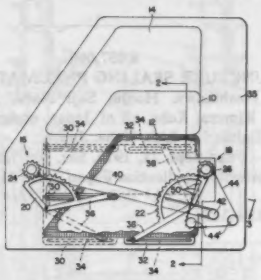
Thomas Smith, 4511 W. Grenshaw, Chicago, Ill. 60624

Filed July 19, 1976, Ser. No. 706,270
Int. Cl.² E06B *9/52*
U.S. Cl. 160—37 **1 Claim**

1. An apparatus for selectively moving a transparent pane and a screen pane across a window opening comprising:

first and second mechanisms for moving said transparent and screen panes, respectively, from a respective first position leaving the opening uncovered, to a respective second position covering said opening, said mechanisms including respective segmental gears disposed on one side of the panes, respective pinions engaging said gears, each of said pinions including a handle for the rotation thereof, and wherein said panes have respective lower end portions formed with a longitudinal slit, and each of said gears includes an arm rigid therewith having an end thereof adapted to slide within one of said slits, and

inhibiting means for preventing the movement of said screen pane from the first and second positions thereof upon said transparent pane occupying a position other than the latter's first position but not yet at the second position, said inhibiting means including first belt-means, first belt-supporting means attached to a door frame for said first belt-means to be movable by the handle of said first mechanism, second belt-means and second belt-supporting means attached to the door frame for said second belt-means to be movable by the handle of said second mechanism, said first belt-means having narrower and wider portions of first and second lengths, respectively, and said second belt-means having a plurality of substantially equispaced longitudinal pins thereon, and being disposed transversely to said first belt-means, and wherein said second length of said wider portion of said first belt-means



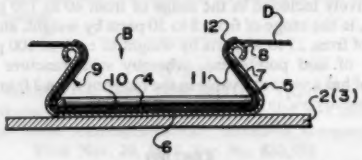
is operatively contactable by at least two successively spaced pins, said narrow portion being operatively non-contactable by said pins, said second length of said wider portion corresponding to the distance for said transparent pane to operatively move from said first to said second position, whereby a rotation of one of said handles causes the handle-associated pane to move across the window opening and the handle of said second mechanism is substantially prevented from being rotated upon said wider portion of said first belt-means being interposed between said two successively spaced pins.

4,057,095

FLEXIBLE SHEET FIXING DEVICE

Yoshinari Hirota, 773-38, Shimokizaki, Oaza, Urawa, Saitama, Japan

Filed Nov. 3, 1975, Ser. No. 628,124
Int. Cl.² A44B *21/00*
U.S. Cl. 160—392 **3 Claims**



1. A device for stretching and fixing flexible sheets over a skeleton framework to enclose the framework, said device comprising, in combination, an elongated channel having a substantially flat base and outwardly extending flanges converging toward each other to define, with said base, an outwardly opening groove which has a dovetail shape in cross-section; said base being arranged to be secured to a skeleton framework so that plural such channels can be secured to the framework to extend longitudinally thereof in spaced parallel relation to each other; an elongated, undulating zig-zag spring resiliently engageable in said dovetail groove adjacent said base; and a pressing plate in the form of an elongated channel member having a base and flanges extending outwardly from said base, said elongated channel member being sufficiently flexible laterally for pressing of the same into the dovetail groove of said channel with the flanges of said channel mem-

ber resiliently pressing outwardly against the flanges of said channel; whereby, after a flexible sheet has been stretched transversely over said channel and into the dovetail grooves thereof, a respective pressing plate may be pressed into the dovetail groove of each channel so that the sheet is retained between the interior surfaces of the channel and the exterior surfaces of the pressing plate, and a respective said zig-zag spring may be inserted into each pressing plate to firmly compress the flexible sheet between the exterior surfaces of the pressing plate and the interior surfaces of the channel.

4,057,096

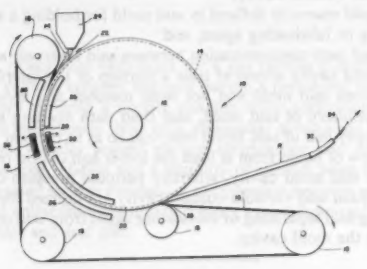
STARTING DUMMY BAR POSITIONER FOR CONTINUOUS CASTING OF METALS

Kerim Askin, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Apr. 9, 1976, Ser. No. 675,340

Int. Cl.² B22D *11/06, 11/08*

U.S. Cl. 164—49 **12 Claims**



7. An improved method for continuously casting molten metal into a rod of indefinite length by use of a rotatable casting wheel having an elongate, arcuate-shaped molding passageway for receiving and cooling molten metal during its movement through the passageway to at least partially solidify the same, comprising the steps of:

providing means adjacent an intermediate position in the passageway for frictionlessly but positively retaining a metal member for blocking the passageway at said position;

activating said retaining means;

inserting a metal blocking member into the passageway and passing the member therealong to said intermediate position for retention by said retaining means;

pouring molten metal into an upper opening of the passageway to be contained therein by said blocking member;

at least partially solidifying the molten metal in said passageway;

deactivating said retaining means to release the blocking member; and

initiating rotation of said casting wheel to pass said blocking member and the at least partially solidified molten metal along the passageway and out of said passageway through a lower opening therein.

4,057,097

CASTING PROCESS WITH INSTANTANEOUS UNIDIRECTIONAL SOLIDIFICATION

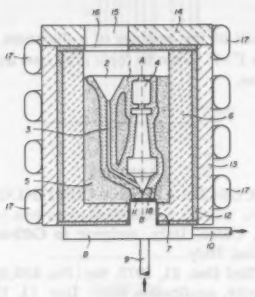
Benno Lux, Veyrier; Wilfried Kurz, Lausanne, both of Switzerland; Jean-Claude Hubert, Saint-Maur; François Mollard, Gaillard, both of France, and Guido Walt, Geneva, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Mar. 5, 1976, Ser. No. 664,093

Claims priority, application Switzerland, Mar. 7, 1975, 2895/75

Int. Cl.² B22D *27/20*

U.S. Cl. 164—60 **6 Claims**



1. A process for producing a solid body of a metallic alloy with a unidirectionally oriented fine dendritic structure obtained by solidification of an alloy melt within a cavity of a mold associated with controllable heating and cooling means capable of producing a unidirectional temperature gradient in said melt, said process comprising the steps of:

a. progressively precooling the entire body of the alloy melt within the mold cavity down to a supercooled liquid state in metastable equilibrium so as to thereby form a homageneous supercooled melt of said alloy throughout the mold cavity while simultaneously maintaining a unidirectional temperature gradient along said supercooled melt; and

b. provoking complete solidification of the entire supercooled alloy melt practically instantaneously throughout the mold cavity by disturbing the said state of metastable equilibrium in said supercooled alloy melt, so as to thereby solidify said body with growth of a fine dendritic crystal structure oriented parallel to the direction of said temperature gradient.

4,057,098

METHOD OF PRODUCING THIN-WALLED CASTINGS

Boris Pavlovich Platonov, ulitsa Komsomolskaya, 11, kv. 4; Anton Abramovich Ryzhikov, Naberezhnaya Zhdanova, 80, kv. 28, and Jury Borisovich Platonov, ulitsa Dyakonova, 8, kv. 40, all of Gorky, U.S.S.R.

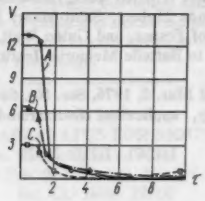
Continuation of Ser. No. 593,521, July 7, 1975, abandoned, which is a continuation of Ser. No. 506,836, Sept. 17, 1974, abandoned, which is a continuation of Ser. No. 359,887, May 14, 1973, abandoned. This application June 21, 1976, Ser. No. 697,717

Int. Cl.² B22D *15/02, 27/04*

U.S. Cl. 164—125 **1 Claim**

1. A method of producing castings having thin walls and thick walls comprising the steps of: pouring inoculated cast iron consisting essentially of, by weight, 3.6–3.8% carbon, 2.8–3.2% silicon, up to 0.4% manganese, not more than 0.01% magnesium and the remainder being iron at a melt temperature within the range of from 1420° to 1450° C into moulds; and subsequently cooling portions of the cast iron with thin walls of the castings being up to 3 mm that the initial cooling rate is

10°–14° C/sec to form nodular cast iron in the thin-walled portions and simultaneously cooling portions of the cast iron



with thick walls of the castings of a thickness that the initial cooling rate is 1°–4° C/sec to form gray cast iron in the thick-walled portions.

4,057,099

DEVICE FOR OSCILLATING A CONTINUOUS CASTING MOULD

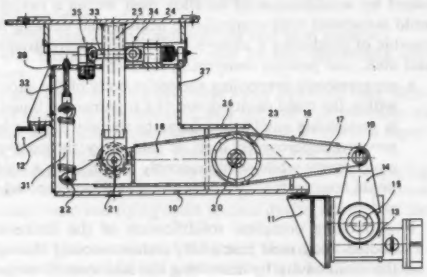
Luigi Danieli, Udine, Italy, assignor to Officine Meccaniche Danieli, Udine, Italy

Filed Dec. 11, 1975, Ser. No. 639,692

Claims priority, application Italy, Dec. 11, 1974, 83446/74; Dec. 12, 1974, 83449/74; Nov. 19, 1975, 83476/75

Int. Cl.² B22D *11/04*

U.S. Cl. 164—260 **10 Claims**



1. In a device for oscillating ingot moulds in continuous casting plants, the oscillations being in a linear or a curvilinear course, the improvement comprising in reciprocal coordination and cooperation

lever means mounted on a fulcrum and extending laterally to an ingot mould and attached to a pair of arms disposed symmetrically with respect to said ingot mould,

a pair of vertical uprights positioned laterally to said ingot mould and hinged onto said arms of said lever and both extending upwards to a surface supporting said ingot mould and being rigidly fixed to said surface,

guide surfaces geometrically defined by the course of said ingot mould and secured to said vertical uprights,

roller guides for each vertical upright anchored to a carrying structure and cooperating with said guide surfaces, and

elastic adjustable traction means extending above said lever attached to said lever and to a fixed support and located laterally to the ingot mould to urge an upward thrust to said lever;

said guide surfaces being anchored in close proximity to said support surface supporting the ingot mould and said lever means is positioned below the upper surface of the ingot mould.

4,057,100

APPARATUS FOR THE LUBRICATION OF HOT HEAD CONTINUOUS CASTING MOLDS

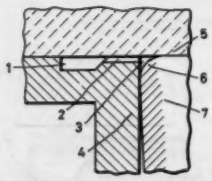
Edgar Lossack; Kurt Krämer, and Gerd Bulian, all of Bonn, Germany, assignors to Vereinigte Aluminum-Werke Aktiengesellschaft, Bonn, Germany

Filed June 1, 1976, Ser. No. 691,616

Claims priority, application Germany, June 7, 1975, 2525483

Int. Cl.² B22D *11/00*

U.S. Cl. 164—418 **6 Claims**



1. Apparatus for continuously casting molten metal comprising:

a mold having a longitudinal axis, an inner, axially extending wall defining a mold cavity, and an upper surface;

a hot head member formed of a heat insulating material having a first portion extending transversly over at least a part of said mold cavity, at least part of said hot head member being contiguous with a surface of said mold, said first portion and axially extending mold wall together with a fluctuating level of molten metal during continuous casting of metal in said mold funtioning to define a variable volume cavity,

a liquid reservoir defined in said mold for holding a separating or lubricating agent; and

a fluid path communicating between said reservoir and said mold cavity across at least a portion of the interface between said mold and hot head member and around the periphery of said mold, said fluid path opening into the upper half of said liquid reservoir so as to prevent gravity flow of liquid from at least the lower half of said reservoir to said mold cavity, whereby periodic pressure changes within said variable volume cavity are utilized for pumping said separating or lubricating agent from said reservoir to the mold cavity.

4,057,101

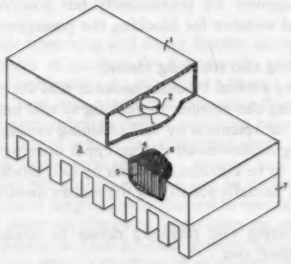
HEAT SINK

Roswell J. Ruka, Pittsburgh, and Robert G. Charles, Allison Park, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 10, 1976, Ser. No. 665,599

Int. Cl.² C09K *5/06*; H01B *7/34*

U.S. Cl. 165—1 **8 Claims**



1. A method of storing heat comprising repeatedly transfer-

ring heat to a heat sink which comprises a compound selected from the group consisting of $LiClO_4.3R_2O$ and $(COOH)_2.2R_2O$, where 100% of each R is independently selected from 0 to 100% hydrogen and 0 to 100% deuterium.

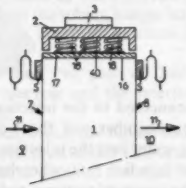
5. A method of protecting electronic circuitry from temporary overheating comprising (1) transferring heat from said circuit to a heat sink comprising a compound selected from the group consisting of $LiClO4.3R_2O$ and $(COOH)_2.2R_2O$, where 100% of each R is independently selected from 0 to 100% hydrogen and 0 to 100% deuterium; and (2) radiating said heat away from said heat sink.

4,057,102

ROTARY HEAT EXCHANGER, IN PARTICULAR FOR A GAS TURBINE

Jack Guillot, Juvisy sur Orge, France, assignor to Bennes Marrel, Zone Industrielle, Andrezieux Boutheon, France

Division of Ser. No. 418,803, Nov. 23, 1973, Pat. No. 3,985,181.
This application June 6, 1975, Ser. No. 584,661
Claims priority, application France, Nov. 22, 1972, 72.42150
Int. Cl.² F28D *19/00*
U.S. Cl. 165—8 **1 Claim**



1. A rotary heat exchanger for a gas turbine comprising a disc of cellular ceramic material having a peripheral lining of refractory material, a smooth metallic collar surrounding said lining in engagement therewith, an annular driving rim having a smooth radially inward surface surrounding said collar in radial spaced relation and a plurality of annular rows of radially disposed springs disposed in compression between said rim and said collar for transmitting driving torque from said rim to said collar and said disc.

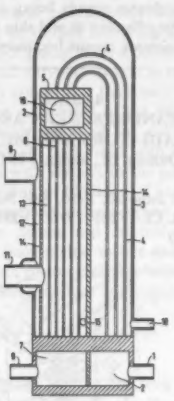
4,057,103

FEEDWATER PREHEATER WITH TWO STEAM CHAMBERS

Herbert Tratz, Ottensoos; Fritz Kelp, and Erich Netsch, both of Erlangen, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Dec. 8, 1975, Ser. No. 638,458
Claims priority, application Germany, Dec. 10, 1974, 2458474
Int. Cl.² F22D *1/32*
U.S. Cl. 165—11 **3 Claims**

1. Feedwater preheater installable horizontally within a turbine exhaust steam housing for heating feedwater by means of condensing bleeder steam from the turbine, comprising inlet and outlet chambers for the feedwater both located at one side of the preheater, an outer steam chamber adjacent said inlet and outlet chambers, an inner steam chamber disposed within said outer steam chamber, means for supplying the bleeder steam at different pressures to the respective steam chambers, a water chamber closed in itself partially defining said inner steam chamber, a plurality of feedwater conducting tubes communicating with said feedwater inlet chamber and disposed in said outer steam chamber, said tubes having a substantially 180° bend formed therein at a location of said outer steam chamber remote from said feedwater inlet chamber and communicating at said bend thereof with said water chamber, and a plurality of additional tubes disposed in said inner steam chamber and communicating at one end thereof with said



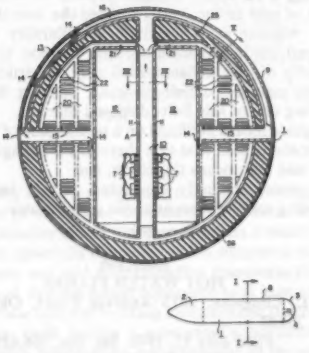
water chamber and at the other end thereof with said outlet chamber.

4,057,104

TEMPERATURE CONTROLLED AIRBORNE ELECTRONIC ASSEMBLY

Frank E. Altoz, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1976, Ser. No. 717,965
Int. Cl.² F28D *15/00*; G05D *23/00*
U.S. Cl. 165—35 **6 Claims**



1. An airborne assembly comprising,
a pod for mounting on the exterior of an aircraft in subjection to air flow past the aircraft during flight,
heat creating electronic components disposed within said pod, p1 evaporative cooling fluid disposed within said pod, p1 vertically extending evaporator means within said pod in close thermal coupling with said electronic components and having bottom inlet for said cooling fluid in liquid state and an upper exit for said cooling fluid in vapor state,
a first condenser means for the cooling fluid vapor from said evaporator means utilizing the outer skin of said pod for transfer of heat to the air passing thereover,
duct means for return of cooling fluid in liquid state from said first condenser means to said evaporator inlet,
a second condenser means in form of heat sink means within said pod, and

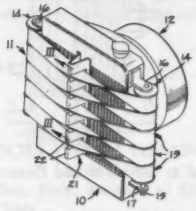
p1 duct means for conveying cooling fluid to and from said second condenser means in series with said evaporator means and in parallel with said first condenser means,

said second condenser means being so constructed and arranged as to be effective at pod skin temperatures at which said first condenser means becomes ineffective.

4,057,105
SELF-CLEANING SCREEN ASSEMBLY FOR RADIATORS AND METHOD

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 30, 1976, Ser. No. 701,335
Int. Cl.[2] F28F *19/00*; F28G *13/00*
U.S. Cl. 165—119 15 Claims



1. A self-cleaning screen assembly in combination with a vertically disposed radiator comprising

perforated endless belt means circumventing said radiator comprising a plurality of horizontally disposed and vertically spaced endless belts each half-twisted to form a "mobius strip",

first guide means mounted on either end of said radiator for engaging and guiding said belt means thereover,

second guide means mounted on a first side of said radiator for engaging and guiding said belt means thereover comprising a vertically disposed bracket secured on the first side of said radiator intermediate the lateral side thereof and wherein said bracket has a plurality of vertically spaced guide members secured thereon to extend forwardly of said radiator, each pair of vertically adjacent guide members defining a guide opening there between having one of said belts disposed therein,

third guide means mounted on a second side of said radiator, opposite to said first side thereof, for engaging and guiding said belt means thereover, and

drive means drivingly connected to said belt means for moving said belt means about said radiator.

4,057,106
HOT WATER FLOOD

Walter L. Clingman, 2013 Andover Court, Oklahoma City, Okla. 73120

Filed July 12, 1976, Ser. No. 704,425
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—57 1 Claim

1. Injection apparatus for injecting hot water into an oil well head, the injection apparatus comprising:

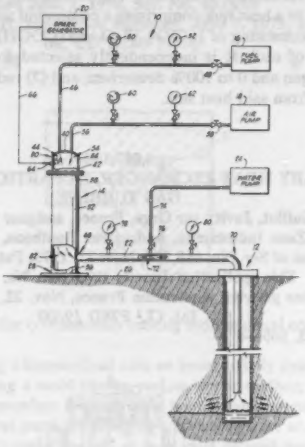
a substantially cylindrical combustion chamber having an upper end and a lower end;

a fuel pump connected to the upper end of the combustion chamber, the fuel pump injecting combustible fuel into the combustion chamber at a predetermined fuel injection rate;

an air pump connected to the upper end of the combustion chamber, the air pump injecting air into the combustion chamber at a predetermined air injection rate;

a spark generator connected to the combustion chamber near the upper end thereof, the spark generator providing sparks for initiating combustion of the combustible fuel injected by the fuel pump into the combustion chamber;

an injection conduit connected between the lower end of the combustion chamber and the well head, the injection conduit providing communication between the combustion chamber and the well head, whereby the combustion gases are injected through the injection conduit into the well head; and



a water pump connected to the injection conduit between the combustion chamber and the well head, the water pump injecting water into the injection conduit at a predetermined water injection rate, whereby the injected water is heated by the combustion gases and injected therewith into the well head via the injection conduit.

4,057,107
METHOD OF INITIATING UNDERGROUND IN-SITU COMBUSTION

Günter Pusch, Celle, and Rudolf Gedenk, Ovelgonne, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 595,266, July 11, 1975, Pat. No. 4,014,721, which is a continuation of Ser. No. 427,158, Dec. 21, 1973, abandoned. This application Nov. 2, 1976, Ser. No. 737,936
Claims priority, application Germany, Dec. 29, 1972, 2263960
Int. Cl.[2] C06B *25/02*; E21B *43/24*
U.S. Cl. 166—260 11 Claims

1. A method for initiating in-situ combustion in an underground formation containing a combustible material said formation being penetrated by an injection well which comprises the steps of:

a. introducing into said formation via said injection well an ignition mixture containing from about 2 to about 30 parts by weight of the total weight of said mixture of olefinic hydrocarbons or unsaturated fatty acids, from about 0.1 to 15 parts by weight of an organic peroxide and from about 0.001 to 0.1 parts by weight of a heavy metal salt,

b. injecting into said formation via said injection well an oxygen-containing gas,

c. continuing said injection of said oxygen-containing gas to ignite said combustible material in said formation.

4,057,108

COMPLETING WELLS IN DEEP RESERVOIRS CONTAINING FLUIDS THAT ARE HOT AND CORROSIVE

Leo P. Broussard, Picayune, Mich., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 19, 1976, Ser. No. 743,267
Int. Cl.[2] E21B *33/10, 43/00*
U.S. Cl. 166—314 10 Claims

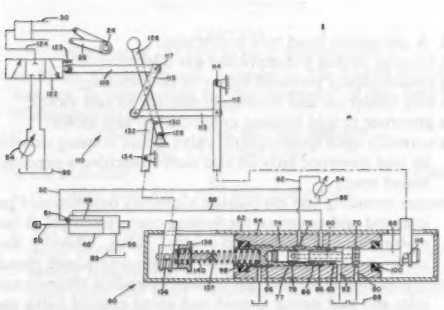
1. A well completing process which comprises:
drilling a borehole into a relatively deep, hot, highly pressurized subterranean reservoir which contains fluid which, at the reservoir conditions, is corrosive to low alloy steel;
installing in the borehole a casing string assembly in which the bottom portion has a corrosion resistant composition capable of resisting corrosion by the reservoir fluid at the reservoir conditions, with said bottom portion being at least about 20 feet long and being arranged to extend substantially into or through the reservoir interval;
equipping the borehole with wellhead components inclusive of a tubing string hanger capable of suspending and sealing around a tubing string extending within the casing string;
suspending a tubing string having a composition capable of resisting corrosion by the reservoir fluid at the reservoir conditions from the tubing hanger so that the tubing string extends into the corrosion resistant portion of the casing string;
establishing at least one path of fluid communication between the reservoir and the interiors of the tubing and casing strings;
circulating fluids within the tubing and casing strings to the extent required to establish a hydrostatic pressure within the bore-hole, at depth of the reservoir, which is less than the fluid pressure within the reservoir;
producing fluid from the reservoir by allowing an outflow of fluid through the top of the tubing string while injecting fluid into the top of the casing string-tubing string annulus at a rate and pressure sufficient to confine substantially all of the reservoir fluid that enters the borehole within the tubing string and the corrosion resistant portion of the casing string; and
as reservoir fluid flows up through the tubing string to a point beyond the tubing hanger, mixing substantially each portion reaching that location with a corrosion inhibitor effective for substantially preventing its corroding of a low alloy steel.

4,057,109

TRACTOR WITH HYDRAULIC DRAFT CONTROL

Roger John Nelson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 4, 1975, Ser. No. 601,659
Int. Cl.[2] A01B *63/112*
U.S. Cl. 172—7 12 Claims



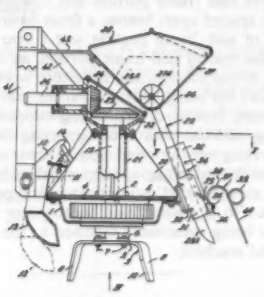
1. In a tractor having power adjusting means for effecting adjustment of an associated implement to increase or decrease draft load, a draft load control comprising: a sourse of pressurized fluid; draft sensor means responsive to draft load and providing a fluid output proportional thereto; load control valve means having an output receiving and main chambers provided therein; pilot piston means positioned in the output receiving chamber and movable therein in response to the fluid output; means fluidly connecting the source to the main chamber responsive to the movement of the pilot piston means to afford or block pressurization of the main chamber by the source; main piston means positioned within the main chamber and movable therein with respect to the pilot piston means in response to the affording or blocking of pressurization, one of said piston means encircled at least at one end thereof by the other of said piston means and control means operatively associated with the main piston means and responsive to the movement of the main piston means to selectively actuate the power adjusting means to effect adjustment of the associated implement.

4,057,110

ROTARY HARROWS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 504,076, Sept. 9, 1974, abandoned, which is a continuation of Ser. No. 312,881, Dec. 7, 1972, abandoned. This application Oct. 17, 1975, Ser. No. 623,422
Claims priority, application Netherlands, Jan. 7, 1972, 7271682
Int. Cl.[2] A01B *33/06, 33/10, 49/06*
U.S. Cl. 172—49 7 Claims



7. A rotary harrow comprising a frame with coupling means at the front of said frame for attaching the harrow to a prime mover, a plurality of soil working members rotatably mounted in a row on upwardly extending shafts supported on a portion of said frame and said row extending transverse to the direction of travel, driving means connected to at least some of said shafts to rotate said soil working members and the lower end of each driven shaft having a substantially horizontal portion which extends substantially perpendicular to the axis of rotation of the corresponding soil working member, said horizontal portion supporting at least one straight blade-like soil working element that extends in an inclined outward position with respect to its corresponding axis of rotation, the diameter of the path described by the lower end of said blade-like element exceeding the distance between the driven shafts of two neighboring soil working members so that overlapping paths are worked by those members, the leading edge of said blade-like element, with respect to the normal direction of rotation of its corresponding soil working member, having a straight cutting edge part that extends rearwardly and downwardly for at least two-thirds of the length of said blade-like element to said lower end, the rear edge of said blade-like element extending substantially straight and downwardly towards said lower end and substantially parallel to the shaft of the corresponding soil working member when that element is viewed from the side, said cutting edge part being located closer to the axis of rota-

tion of the corresponding soil working member than is said rear edge.

4,057,111

SOIL CULTIVATING MACHINES

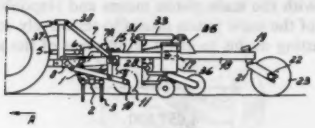
Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Filed Dec. 15, 1975, Ser. No. 640,731

Claims priority, application Netherlands, Dec. 16, 1974, 7416324

Int. Cl.² A01B *33/16, 33/06*

U.S. Cl. 172—72 **10 Claims**



1. A soil cultivating machine comprising a frame and an elongated portion of said frame extending transverse to the direction of travel of the machine, a plurality of soil working members being rotatable about upwardly extending axes defined by upwardly extending shafts positioned in a transverse row and journalled in said frame portion, drive means connected to rotate said shafts, a supporting structure being located above said frame portion and comprising at least two transverse spaced apart beams, a front beam located adjacent the front of said frame portion and a rear beam positioned adjacent the rear of said frame portion, an elongated tool bar extending across substantially the entire working width of said row and said bar being positioned at the rear of said soil working members, rearwardly extending supporting means interconnecting said bar with said supporting structure, a part of said supporting means extending to the rear of said tool bar and at least one ground engaging support wheel being connected to said part, means for adjusting the vertical position of said bar with respect to said wheel, said bar together with said supporting means being detachably fastened to the supporting structure of said machine.

4,057,112

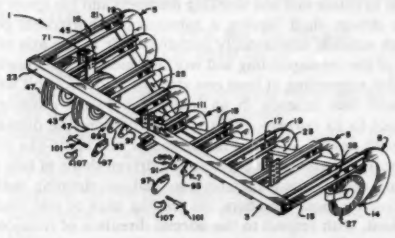
SUBSOIL PLOW

Quentin Taylor, Bethany, Ill., assignor to Grain Systems, Inc., Assumption, Ill.

Filed July 14, 1976, Ser. No. 705,150

Int. Cl.² A01B *13/08, 59/06, 61/04*

U.S. Cl. 172—166 **9 Claims**



1. A subsoil plow having a rigid frame, a plurality of plow teeth, means for mounting each of said teeth on the frame in a plowing position, and means for hitching said frame to a tractor or the like, said tractor being adapted to pull the plow through a field with said teeth penetrating the ground to a desired depth, each of said teeth being a generally forward facing member having an upper portion, a downwardly extending shank, and a bottom tip portion, said mounting means comprising pairs of frame members, one pair for each said tooth, spaced for receiving the upper portion of a respective tooth, said tooth being connected to said frame members by safety release means adapted to release said tooth upon application of a predetermined load to said tooth as occasioned upon the tooth striking an object as it is pulled through the field and by a pivot member located directly above said tip portion of the tooth so that in the event said safety release means releases said tooth while the plow is being drawn through the field, said tooth will rotate rearwardly and upwardly about said pivot member up out of the ground without said tip portion moving below its plowing position, said teeth being arranged in a generally V-shaped array with one of the teeth constituting a center tooth being disposed substantially on the longitudinal center line of the plow forward of the other teeth and with at least one pair of said teeth being spaced laterally outwardly and rearwardly of said center tooth, on both sides thereof, said frame comprising a forward main frame member, said pairs of frame members extending rearwardly from said forward main frame member with one pair of said frame members being located substantially on the longitudinal center line of said plow holding said center tooth, said one pair of frame members being shorter than the other pairs of said frame members, and with said other pairs of frame members being spaced equidistantly from one another and each of said other pairs extending rearwardly a distance greater than its inner adjacent pair of said frame members thereby to hold said teeth in said generally V-shaped array.

4,057,113

PNEUMATICALLY POWERED HAND TOOL WITH SPEED-CONTROL GOVERNOR

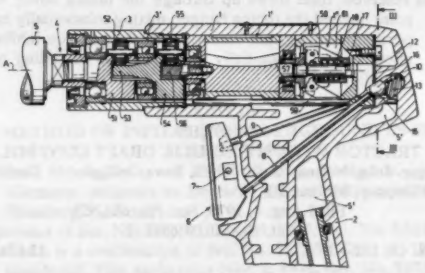
Kurt Paule, Stuttgart; Karl Roll, Leinfelden, and Max Burklin, Waldenbugh, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 3, 1976, Ser. No. 711,411

Claims priority, application Germany, Aug. 22, 1975, 2537395

Int. Cl.² B23Q *5/027*

U.S. Cl. 173—12 **10 Claims**



1. A pneumatic hand tool comprising:

a housing having a compressed-gas inlet;

a pneumatically powered motor in said housing;

a tool holder on said housing connected to said motor;

a governor in said housing connected to said motor;

a normally open speed-control valve in said housing closable by said governor only on said motor reaching a predetermined speed;

means including one gas passage extending between said gas inlet and said governor for feeding compressed gas to said motor through said speed-control valve, whereby said motor is operated at or below said predetermined speed;

means including another gas passage extending between said inlet and said motor around said speed-control valve and a bypass valve in said other passage displaceable between an open position for feeding compressed gas directly to

said motor and thereby operating same at a speed greater than said predetermined speed and a closed position wherein said motor can operate no faster than said predetermined speed; and

an operating member on said housing displaceable by the user of said tool and engageable with said bypass valve for displacing same into said open position.

4,057,114

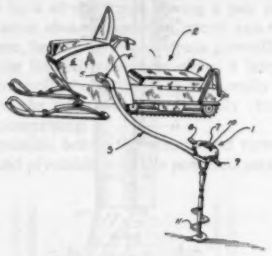
HAND-HELD ICE AUGER

Paul J. Anderson, 947 Poplar St., Hancock, Mich. 49930

Filed Jan. 7, 1976, Ser. No. 647,209

Int. Cl.² E21B *3/02*

U.S. Cl. 173—26 **2 Claims**



1. A hand-held auger powered by a remotely located engine, the combination comprising:

a flexible shaft;

first coupling means fastened to one end of the flexible shaft for attaching it to a rotating shaft on said engine;

a housing having an opening which receives the other end of said flexible shaft;

gear reduction means disposed in said housing and including a drive shaft which is coupled for rotation by said flexible shaft at a substantially reduced rate therefrom;

an auger bit; and

second coupling means for connecting the auger bit to said drive shaft, said second coupling means including:

an auger extension shaft which is rotatably mounted to said housing and extends through a second opening therein to connect with said auger bit, said auger extension shaft also being mounted for translational motion between an engaged position in which it couples to said drive shaft for rotation thereby and a disengaged position in which it is decoupled from said drive shaft;

a bias spring which urges said auger extension shaft into its disengaged position; and

a handle which is disposed around said auger extension shaft and beneath said housing, said handle being restrained from motion along the axis of said auger extension shaft but being freely rotatable thereabout.

4,057,115

FLEXIBLE SHAFT FOR A ROOF DRILL

John Blanz, Carlisle, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,019

Int. Cl.² B23Q *5/00*

U.S. Cl. 173—160 **9 Claims**

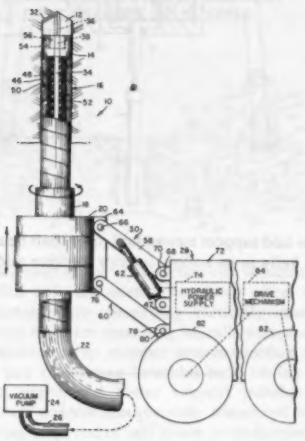
1. A flexible shaft for a roof drill comprising:

a. a rock bit

b. flat band wound in a helical configuration defining an outer casing, adjacent convolutions of said flat band in nesting relationship with ore another at edges thereof to form outer and inner concentric flat cylindrical surfaces for said outer casing;

c. a circular rod wound in ak helical configuration defining an intermediate casing that is disposed within said outer casing, adjacent convolutions of said circular rod touching one another and in close adjacency with said inner surface of said outer casing;

d. a tubular member having a hollow core defining a longitudinal passage, said tubular member disposed within said intermediate casing and defining an inner sleeve having an outer surface in close adjacency with surfaces of said intermediate casing;



e. said outer casing wound in a first direction and said intermediate casing wound in a second direction, said first direction opposite said second direction, said outer casing, said intermediate casing, and said inner sleeve coaxially disposed about a longitudinal axis of said shaft and extending the length of said shaft, and

f. a transition member having one end of said flat band and circular rod attached thereto and said rock bit mounted thereon for a drilling operation therewith.

4,057,116

SLIM HOLD DRILLING

John H. Striegler, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

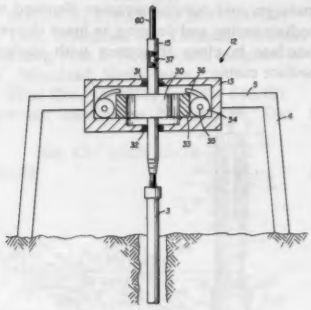
Continuation of Ser. No. 307,544, Nov. 17, 1972, abandoned, which is a division of Ser. No. 223,484, Feb. 4, 1972, Pat. No. 3,724,562, which is a division of Ser. No. 65,177, Aug. 9, 1970, Pat. No. 3,670,832. This application May 8, 1974, Ser. No. 467,947

Int. Cl.² E21B *3/04, 3/10*

U.S. Cl. 173—165 **2 Claims**

1. In a drilling rig having a space in its floor for a rotary table, the improvement comprising a power unit carried by said rig floor in the space for said rotary table, said power unit comprising a support means carried by said rig floor in the space for said rotary table, an electric motor means having a

hollow rotor shaft, said motor means being carried by said support means so that the ends of its rotor shaft extend above



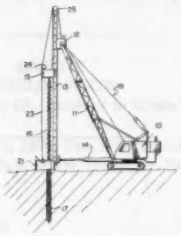
and below said support means, said rotor shaft being adapted to receive a kelly in its hollow interior to drive said kelly.

4,057,117

AUGER SPOIL DISPOSAL BOX

Christopher William Bermingham, Dundas, Canada, assignor to Bermingham Construction Limited, Hamilton, Canada

Filed July 27, 1976, Ser. No. 708,948
Claims priority, application Canada, Aug. 29, 1975, 234632
Int. Cl.² E02D *17/144*
U.S. Cl. 175—88 **12 Claims**



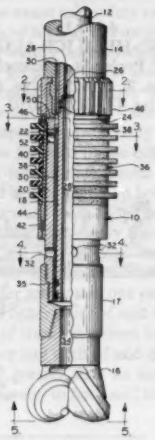
1. A drilling apparatus comprising: an auger for drilling a hole in the ground; leads extending parallel to and supporting said auger and means for guiding said auger to move longitudinally of said leads during drilling; drive means for rotating said auger and for moving said auger longitudinally of said leads; and a container for receiving spoil produced by said auger during drilling, said container being guided upon a lower end of said leads, said auger extending through said container and said container being movable on said leads independently of said auger; means for moving said container longitudinally of said leads independently of said auger between a ground-engaging loading position, wherein the container is situated on the ground at the top of a hole being drilled by the auger to receive spoil removed from the hole by the auger, and an elevated dumping position wherein the container is raised above the ground, and means for discharging spoil from the container when the latter is in the dumping position.

4,057,118

BIT PACKER FOR DUAL TUBE DRILLING

George Alan Ford, Houston, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed Oct. 2, 1975, Ser. No. 618,811
Int. Cl.² E21B *17/00, 17/04, 21/00*
U.S. Cl. 175—215 **10 Claims**



1. A bit packer for use with a string of dual concentric drill pipe above a bit comprising:

an inner tubular member including means for providing fluid-tight interconnection with the inner pipe of said string to provide a conduit for drilling fluid and cuttings from bit to surface;

an outer tubular member arranged concentrically with said inner member and including means for providing fluid-tight interconnection with the outer pipe of said string to provide an annular conduit for drilling fluid from surface to bit;

packing means encircling said outer member and adapted to contact the hole wall and seal the annular space between the hole wall and the outer member;

bearing means for mounting said packing means rotatably with respect to said outer member; and

means for providing a flow of drilling fluid from said annular conduit to said bearing means.

4,057,119

POWERED HAND TRUCK FOR CLIMBING STEPS

James L. Melson, 11365 Orcas Ave., Lake View Terrace, Calif. 91342

Filed Jan. 19, 1976, Ser. No. 650,279
Int. Cl.² B62B *5/02*
U.S. Cl. 180—8 A **28 Claims**

1. A powered hand truck capable of climbing stair steps comprising:

a frame extending in a longitudinal direction from a lower end to an upper end and extending laterally from a left side to a right side, having a front side for retaining a load and a back side, and having a pair of runners extending in the longitudinal direction along the lower portion of the back of said frame;

a pair of support wheels attached for rotation about a common lateral axis to the lower end of said frame;

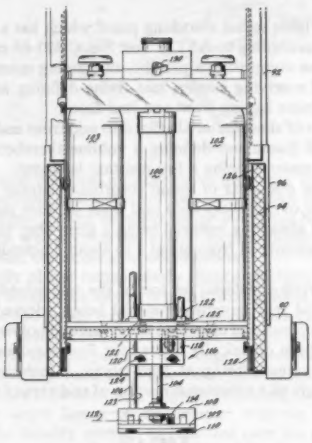
powered means pivotally connected to said frame for limited rotational swinging movement about a lateral axis, said powered means having a powered ram and being selectively operable to extend said ram in a generally longitudinal direction below said wheels, and to maintain said ram held at an attained extension, and to retract said ram;

manually actuable means for operating said powered means to extend said ram for elevating the hand truck to an upper stair step; and

neutralizing means connected between said frame and said powered means and responsive during extension of said ram in climbing a stair step to predetermined pivotal rotation of said powered means toward said front side of said frame as the elevated hand truck begins to roll onto the stair step for automatically operating said powered means to terminate further extension of said ram and maintain the then-attained extension of said ram.

22. In a powered hand truck having a frame extending in a longitudinal direction from a lower end to an upper end and extending laterally from a left side to a right side and having a front side for retaining a load and a back side, having a pair of runners extending in the longitudinal direction along the lower portion of the back of the frame having a pair of wheels attached for rotation about a common lateral axis to the lower end of the frame, having powered means pivotally connected to the frame for limited movement about a lateral axis and having a ram controllably extensible in a generally longitudinal direction below the wheels and controllably retractable, the improvement comprising:

a guard, extensible below the wheels and retractable with the ram, and pivotable with the powered means, disposed



to the rear of the powered means and frontward of said runners, whereby when the hand truck rolls onto a step the guard shields the ram from contacting the edge of the step and limits the rearward roll of the hand truck onto the step until the ram is retracted.

26. In a powered hand truck having a frame extending in a longitudinal direction from a lower end to an upper end and extending laterally from a left side to a right side and having a front side for retaining a load and a back side, having a pair of runners extending in the longitudinal direction along the lower portion of the back of the frame having a pair of wheels attached for rotation about a common lateral axis to the lower end of the frame, said wheels including selectively engageable ratchets, having powered means pivotally connected to the frame for limited movement about a lateral axis and having a ram controllably extensible in response to actuation of an extension trigger by the operator in a generally longitudinal direction below the wheels and controllably retractable, and having neutralizing means connected between the frame and the powered means and responsive to predetermined motion of said powered means relative to said frame for automatically operating said powered means to terminate further extension of said ram and maintain the then attained extension of said ram, the improvement comprising:

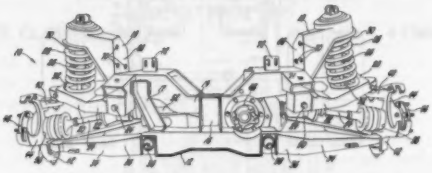
a tripping mechanism interconnected between the extension trigger and the ratchets of the wheels for engaging the wheel ratchets when the extension trigger is actuated.

4,057,120

FRONT WHEEL DRIVE AND SUSPENSION ARRANGEMENT

Jerry M. Roethlisberger, Bridgeport, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 19, 1975, Ser. No. 578,524
Int. Cl.² B60K *17/30, 17/34*
U.S. Cl. 180—44 R **2 Claims**



1. For attachment to the front portion of a vehicular frame as a preassembled unit, an independent front wheel drive and suspension subassembly comprising vertically spaced upper and lower cross members extending laterally across said frame, a centrally located strap member interconnecting said cross members, a pair of steering knuckles each having a central opening and upper and lower support members formed thereon, a lower control arm pivotally connected at the ends thereof between each end of said lower cross-member and one of said lower support members, an upper control arm pivotally connected at the respective ends thereof between each end of said upper cross member and one of said upper support members, a spring tower including a vertical wall portion secured to each of the respective ends of said upper cross member and a substantially horizontal seat portion extending outwardly from said vertical wall portion, a plurality of mounting apertures formed in each of said vertical wall portions, a mounting bracket formed on the upper surface of the upper lateral cross member adjacent each end thereof a predetermined distance from said vertical wall portion, said mounting brackets and said apertured vertical wall portions adapted to receive fastener means for securing said independent front wheel drive and suspension subassembly to said front portion of said vehicular frame, a concentric coil spring and shock absorber mounted between said seat portion of each of said spring towers and the upper surface of said upper control arms, a differential mounted between said lower and upper cross members adjacent one side of said centrally located strap member, a drive axle operatively connected to each side of said differential and extending therefrom through the space between said lower and upper cross members and thence through said opening in said adjacent steering knuckle, a wheel mounting plate mounted on the end of each of said drive wheels adjacent said steering knuckle.

4,057,121

MODULAR REAR AXLE SUSPENSION AND DRIVE ARRANGEMENT FOR TRUCKS

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

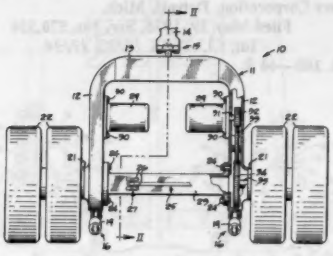
Filed Mar. 8, 1976, Ser. No. 664,719
Int. Cl.² B60K *1/00*
U.S. Cl. 180—56 **12 Claims**

1. A modular axle suspension and drive arrangement adapted for attachment to the main frame of a vehicle comprising

a generally U-shaped sub-frame having a pair of laterally spaced side beams secured together at forward ends thereof by a forward cross-beam disposed transversely relative thereto,

a drive motor, having an output shaft, mounted on each of said side beams,

a spindle secured on a rearward end of each of said side beams and extending laterally outwardly therefrom, the drive motor mounted on each of said side beams being disposed longitudinally between said spindle and said cross-beam,



at least one roadwheel rotatably mounted on each of said spindles, and

drive means drivingly interconnected between the output shaft of each drive motor and a respective roadwheel for selectively driving the same.

4,057,122

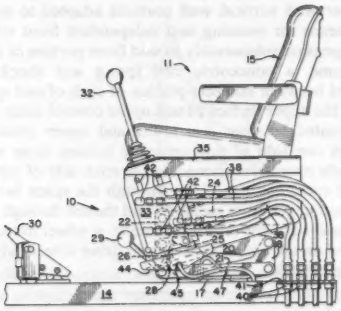
CONTROL ARRANGEMENT FOR A VEHICLE WITH AN ADJUSTABLE SEAT

Roy D. Brownell, and Dean M. Lawrence, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 6, 1976, Ser. No. 702,545

Int. Cl.[2] B60K *26/00*

U.S. Cl. 180—77 S **3 Claims**



1. A vehicle comprising:

a frame;

an operator station selectively positionable relative to the frame;

foot control means mounted on the frame and operable from the operator station for operably controlling the vehicle;

hand control means mounted on and operable from the operator station for operably controlling the vehicle and movable with the station relative to the foot control; and

means mounted on and operable from the operator station for selectively positioning the station relative to the foot control and movable with the station relative to the foot control.

4,057,123

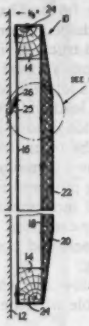
LIGHTWEIGHT SOUND ABSORBENT PANELS HAVING HIGH NOISE REDUCTION COEFFICIENT

Gordon A. Erickson, St. Paul, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Dec. 3, 1975, Ser. No. 637,415

Int. Cl.[2] E04B *2/74*

U.S. Cl. 181—286 **8 Claims**



1. A portable sound absorbing panel which has a fire rating of Class 1 according to ASTM Test No. C-423-66 comprising:

a. a frame comprising a plurality of framing members capable of receiving staples, said frame defining an area and said frame having front and rear faces;

b. a layer of sheet material affixed to said front and rear faces of said frame and defining a volume therebetween, said sheet material being a fire resistant laminate;

c. at least one layer of sound absorbing material positioned on one of said faces atop said layer of sheet material said sound absorbing material being a glass fiber blanket having a density of from about ½ to about 3 pounds per cubic foot;

d. a covering material on top of the said sound absorbing material said covering material being selected from the group consisting of woven fiberglass and polyesters which have been chemically treated for fire retardancy;

e. said volume being at least about ½ inch in thickness throughout a substantial portion of said area of said frame.

4,057,124

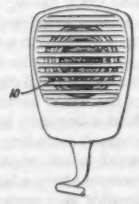
SOUND SUPPRESSOR

Harold C. Braden, 7589 Bear Creek Road, Fairview, Pa. 16415

Filed Dec. 30, 1975, Ser. No. 645,417

Int. Cl.[2] F01N *7/00*

U.S. Cl. 181—242 **3 Claims**



1. A sound suppressor for a microphone, said microphone having a voice passage therein, comprising:

two annular sheets of metal foil, each having an opening in the center,

a round disc of metallic foil and a round disc of soft, paper-towel-like material resting on each other and sandwiched between said annular sheets of metal foil, concentric with each other and closing said opening in the center and

secured to said annular sheets of foil along the periphery of said opening,

adhesive material holding said annular sheets together and holding said discs therebetween, and

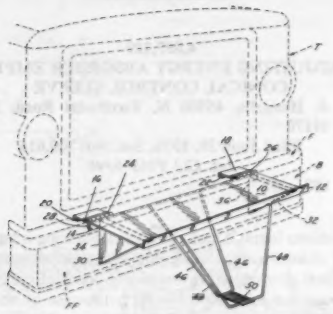
the outside of one said annular sheet of material having pressure-sensitive adhesive thereon for holding said sound suppressor to said microphone over said voice passage.

4,057,125

BUMPER-MOUNTED TRUCK SERVICING PLATFORM

Frederick J. Kroft, R.F.D. No. 1, Box 90, Medaryville, Ind. 47957

Filed Nov. 29, 1976, Ser. No. 745,787
Int. Cl.[2] B60R 3/00
U.S. Cl. 182—91 2 Claims



1. A service platform for removable mounting on a vehicle bumper disposed adjacent a vertical wall portion of the vehicle, the bumper having an upper flange extending horizontally toward such wall portion and a front vertical flange providing a frontal face, comprising, in combination:

a generally planar rectangularly shaped platform member;

a pair of hooks each having a planar first portion adapted to overlie the upper edge of the bumper and extend completely thereacross, and a planar second portion connected to the first portion at an edge thereof and underlying the first portion and disposed in parallel space relation therefrom a distance only slightly exceeding the thickness of the upper flange of the bumper, whereby said hook must be slidably inserted or removed over the inner edge of the top flange in a substantially horizontal direction, and wherein the free length of the planar second portion of each hook is less than the horizontal distance between the inner edge of the bumper upper flange and the adjacent vertical wall of the vehicle but of sufficiently great length so that said hook cannot be pivoted upwardly when operatively embracing such flange;

said hooks being spaced apart along a longer side of the platform and pivotally connected thereto at the edge of the platform;

said platform being swingable relative to the hooks to a substantially vertical position while the hooks are in a horizontal position and shiftable toward the vertical wall of the vehicle to dispose said second hook portion between the inner edge of the bumper upper flange and the vertical wall of the vehicle and said platform shiftable away from said vertical wall of the vehicle to cause said hooks to slidably embrace the bumper upper flange;

said platform including a pair of braces disposed on the underside thereof in laterally spaced apart relation for engaging the frontal face of the bumper when the platform is in a horizontal position with the hooks embracing the bumper upper flange;

said hinge connection between the hooks and platform being disposed at the intersection of the upper flange and vertical flange of the bumper when the platform is mounted on the bumper whereby the weight of the platform and a load carried thereby is taken by the first hook portion in flat face-to-face engagement with the bumper upper flange; and

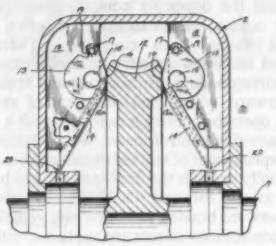
a step connected to the platform and disposed spaced below and somewhat forwardly of the same.

4,057,126

LUBRICANT WIPER

Robert K. Stephens, Brookfield, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Mar. 25, 1976, Ser. No. 670,208
Int. Cl.[2] F01M 1/00
U.S. Cl. 184—11 R 4 Claims



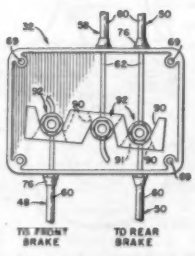
1. A self-adjusting lubricant wiper for wiping lubricant from a generally vertical side of a rotating object, said wiper being adapted to be pivotally connected to a support for positioning near said rotating object, said wiper being a generally teardrop shaped member which is adapted to be pivotally attached to the support at its narrow upper end, said wiper having a center of gravity which is to the opposite side of the pivot point of the curved wiping surface so that the wiping surface is maintained by gravity in a wiping relationship with the side of said rotating object.

4,057,127

SAFETY ACTUATING DEVICE ADAPTED FOR TWO WHEELED VEHICLES

Cooper Coolidge Woodring, Plandome, N.Y., assignor to J. C. Penney Company, Inc., New York, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,573
Int. Cl.[2] B62L 3/08
U.S. Cl. 188—24 19 Claims



1. A safety actuating brake device for controlling the application of braking action to a vehicle having at least two wheels, one wheel being a forward wheel, the other wheel being a rearward wheel, each wheel having associated therewith means for braking and unbraking the rotation thereof in response to displacement inputs directed thereto and forward and rearward associated operator control means which comprises:

a. movable control means positioned intermediate the forward and rearward braking means and the associated operator control means and being displaceable for at least initiating braking action on the rear wheel in response to at least one displacement input;
b. means operatively communicating said movable control means with said rearward braking means;
c. means operatively communicating said rearward operator control means with said movable control means and with said associated rearward braking means;
d. means operatively communicating said movable control means with said forward braking means;
e. means operatively communicating said forward operator control means with said movable control means, wherein the operative communication between the forward and rearward operator control means to said movable control means and the operative communication between said movable control means to said respective forward and rearward vehicle wheels being such that actuation of said associated rearward operator control means produces at least a corresponding displacement and braking action of said rearward wheel, and actuation of said associated forward operator control means produces a displacement of said movable control means which enables at least an initial displacement of said rearward brake means which at least initially exceeds the displacement and braking action applied to said forward wheel thereby assuring at least initial rearward braking action on said vehicle when operational control movements are applied to either said rearward or forward operator controls.

4,057,128

SLACK ADJUSTERS FOR VEHICLE BRAKES

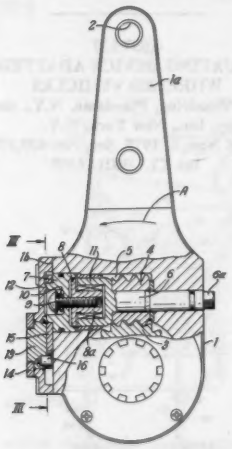
Ralph Coupland, Lincoln, England, assignor to Clayton Dewandre Company Limited, Lincoln, England

Filed Feb. 5, 1976, Ser. No. 655,500

Claims priority, application United Kingdom, Feb. 12, 1975, 5943/75

Int. Cl.² F16D 65/56

U.S. Cl. 188—79.5 K **7 Claims**



1. An automatic slack adjuster for a vehicle brake mechanism comprising a rockably mounted actuating arm, a rotatable worm wheel on said arm meshed with said worm and adapted to be secured upon a brake camshaft, the axis of said worm being perpendicular to that of the camshaft, means connecting said arm to actuating means for rocking said arm about the axis of said camshaft during brake operation, a member pivotally mounted on said arm for oscillation about a fixed axis, means whereby said member is displaced about its pivot axis when said arm is rocked through more than a predetermined angle in the brake applying direction, motion transmitting means extending between said member and said worm comprising a unidirectional sprag clutch so constructed and arranged that whenever said arm rocks through more than said predetermined angle to rotate said camshaft in the brake applying direction the resultant pivotal displacement of said member is ineffective to rotate said worm but upon rocking of said arm in the return direction said member is effective to rotate said worm and thereby rotate said worm wheel to impart a corrective adjustment to said camshaft, a friction clutch in said motion transmitting means having frictionally engaged elements and means resiliently biasing said elements together, said biasing means providing for drive interruption in said friction clutch when the load at the brake camshaft exceeds a predetermined amount during said return movement of said member.

4,057,129

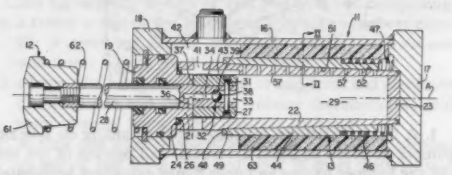
SELF ADJUSTING ENERGY ABSORBER EMPLOYING CONICAL CONTROL SLEEVE

Ransom J. Hennells, 45500 N. Territorial Road, Plymouth, Mich. 48170

Filed June 28, 1976, Ser. No. 700,616

Int. Cl.² F16F 9/48

U.S. Cl. 188—285 **8 Claims**



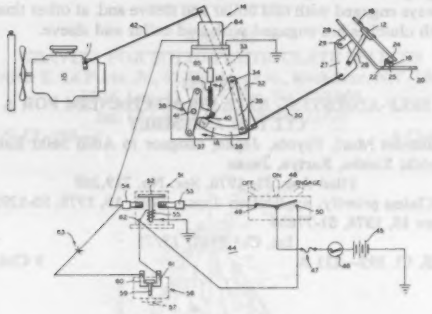
1. In a fluid-type energy absorber having a substantially closed housing, ram means slidably disposed on said housing for receiving a shock load thereon, said ram means including a piston slidably disposed within said housing and fixedly connected to a piston rod extending outwardly from one end of said housing, a sleeve member disposed within said housing and cooperating with said piston for forming first and second fluid chambers which are in selective fluid communication with one another, said piston being slidably supported for displacement relative to said sleeve member in the axially extending direction thereof, and flow passage means providing selective fluid communication between said first and second chambers for limiting the fluid flow between said chambers for absorbing the energy of an externally applied load as said piston is moved axially relative to said sleeve member, said flow passage means including opening means extending radially through the wall of said sleeve member and being elongated in the axially extending direction of said sleeve member, the improvement comprising control means for automatically adjusting said flow passage means responsive to the magnitude of the externally applied load to at least momentarily increase the minimum flow area of said flow passage means substantially in proportion to the pressure increase of the fluid within one of the chambers as said pressure increases in response to imposition of an external load, said control means including a control sleeve which is relatively movable with respect to said sleeve member for increasing the minimum flow area of said flow passage means, said control sleeve being concentric with said sleeve member and extending axially thereof over at least that portion of said sleeve member containing said opening means therein, said piston being slidably engaged with one of the annular peripheral surfaces of said sleeve member, and said control sleeve being closely positioned adjacent the other annular peripheral surface of said sleeve member.

4,057,130

THROTTLE HOLDING DEVICE

Dean S. Robertson, Aurora, Ill., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Sept. 25, 1975, Ser. No. 616,737
Int. Cl.² B60K *29/02*
U.S. Cl. 192—3 T 4 Claims



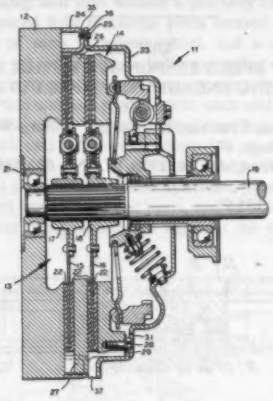
1. A holding device for a throttle of an internal combustion engine including an internal combustion engine throttle lever, a throttle rod operatively connected to the throttle lever, the throttle rod being segmented into two portions having a bell crank mechanism disposed between respective ends of opposite portions of the throttle rod, the first segment of the throttle rod operatively connected between the throttle lever and one end portion of the bell crank mechanism, the second segment of the throttle rod operatively connected between the opposite end of the bell crank mechanism and one end of the second segment of the throttle rod, the opposite end of the second segment of the throttle rod being operatively connected to a throttle pedal operable to urge the throttle lever toward a throttle open position, the bell crank mechanism having a mounting member, a bellcrank lever pivotally mounted on the member, a coextensive member rigidly connected adjacent the bellcrank lever, the coextensive member engageable with a friction device capable of gripping said coextensive member to retain the bell crank mechanism and the throttle rod connected thereto in a preset position, and means for operating the friction device including an electrical solenoid capable when energized of urging the brake into engagement with the coextensive member to restrict its movement, and an operating circuit for engaging and disengaging the solenoid, said circuit comprising an energy source, a manually operated electrical switch for connecting said electrical energy means to the solenoid, a three-position switch disposed in the circuit engageable in a first position to activate the circuit, in a second position to maintain the circuit in an operating condition and in a third position to deactivate the circuit, a magnetic switch engageable upon engagement of the three-position switch to the first position, the engagement of the magnetic switch supplying electrical energy to the solenoid for operation thereof, and a hydraulically operated switch provided in the operating circuit capable of disconnecting the solenoid from said electrical energy source when the hydraulic pressure in the switch is above a predetermined minimum, whereby the throttle lever is movable between a throttle closed position and a throttle open position and the friction device may be engaged to hold the throttle rod in a predetermined position which maintains the throttle lever in an open position and may be disengaged to release the throttle rod and return the throttle lever to a closed position.

4,057,131

MULTIPLE DISK CLUTCH STAMPED ADAPTER RING

Richard A. Flotow, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed May 10, 1976, Ser. No. 684,626
Int. Cl.² F16D *13/00*
U.S. Cl. 192—70.13 5 Claims



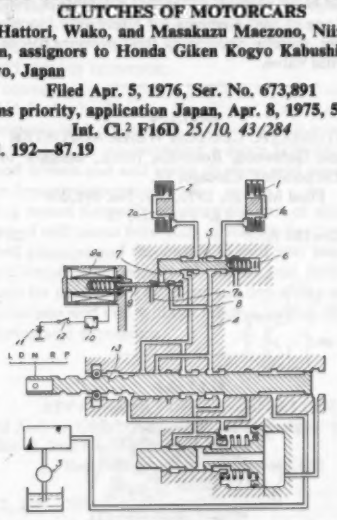
1. An adapter ring attached to a clutch cover to extend the axial length of the clutch cover to accommodate a clutch assembly of increased length, the adapter ring comprising: a stamped sheet metal annular element having a generally "U"-shaped cross-section with a central portion, an outwardly facing leg and an inwardly facing leg wherein said central portion and said inwardly facing leg have a plurality of slots formed therein for receiving lugs of a driven plate.

4,057,132

SHIFT CONTROL FOR HIGH AND LOW SPEED CLUTCHES OF MOTORCARS

Torao Hattori, Wako, and Masakazu Maezono, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1976, Ser. No. 673,891
Claims priority, application Japan, Apr. 8, 1975, 50-41776
Int. Cl.² F16D *25/10, 43/284*
U.S. Cl. 192—87.19 1 Claim



1. A control apparatus for motorcars, having an automatic transmission with a speed-change sensor and a shift valve therein, for controlling the operation of the latter, the apparatus comprising an oil-pressure operated high-speed clutch interposed in a high-speed system, and an oil-pressure operated low-speed clutch interposed in a low-speed system of said

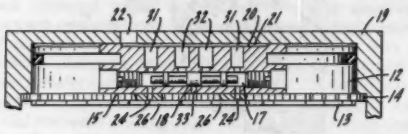
transmission, said systems being selectively connectable through said shift valve to a line pressure supply passage connected to an oil-pressure source and having a manually operable valve interposed therebetween, wherein said shift valve is operable by the oil pressure in one of a plurality of operational modes of said transmission, and has at one end an oil-pressure chamber connectable to said supply passage through an electromagnetic pilot valve responsive to said sensor.

4,057,133

SLIP SPEED RESPONSIVE DEVICE FOR CONTROLLING ENGAGEMENT OF FLUID ACTUATED CLUTCH

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 24, 1976, Ser. No. 689,423
Int. Cl.[2] F16D *43/284*
U.S. Cl. 192—103 F 6 Claims



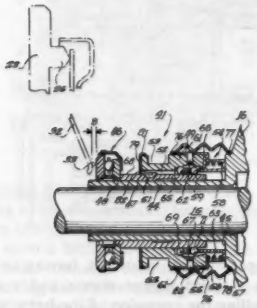
1. In a fluid actuated friction clutch having rotatable driving and driven elements and a fluid pressure responsive piston for engaging said elements, said piston and one of said elements forming a chamber adapted to receive fluid under pressure, the improvement comprising a bleed passage communicating with said chamber, and fluid control means responsive to relative rotation of said elements for increasing the rate of bleed from said chamber as the relative rotation of said elements decreases, said fluid control means including a cylinder communicating with said chamber, spaced vent passages communicating with said cylinder, a fluid pressure responsive shuttle valve movable in said cylinder between positions blocking and unblocking said bleed passage, and means rotatable in response to rotation of one of said elements for alternately blocking said vent passages, thereby developing fluid pressure forces acting on said shuttle valve.

4,057,134

AUTOMATIC CLUTCH WEAR ADJUSTER

Sidney Ulane Gatewood, Roseville, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 28, 1976, Ser. No. 691,059
Int. Cl.[2] F16D *13/75*
U.S. Cl. 192—111 A 21 Claims



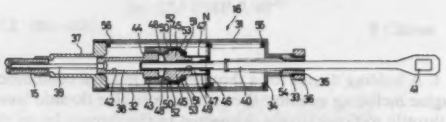
1. A self-adjusting clutch release bearing assembly operated by a clutch release fork, the clutch including clutch release levers adapted to be engaged by a release bearing to disengage the clutch, said bearing assembly comprising a bearing carrier adapted to axially reciprocate on the driven shaft and including a sleeve encompassing the driven shaft and supporting the release bearing, a collar telescoped over said sleeve and adapted to move relative thereto, means to limit movement of said collar away from said clutch, said clutch release fork being operatively connected to said collar, a pair of opposed one-way clutches between said sleeve and collar, and biasing means urging said one-way clutches apart so that at least one clutch is always engaged with said collar and sleeve and, at other times, both clutches are engaged with said collar and sleeve.

4,057,135

SELF-ADJUSTING RELEASE MECHANISM FOR A CLUTCH ASSEMBLY

Masanori Mori, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 31, 1976, Ser. No. 719,269
Claims priority, application Japan, Sept. 19, 1975, 50-12939; June 15, 1976, 51-77654
Int. Cl.[2] F16D *13/75*
U.S. Cl. 192—111 A 9 Claims



1. A clutch assembly for connecting driving and driven shafts comprising:

a. clutch means for normally effecting a driving connection between said shafts;

b. clutch release levers actuable for disengaging the driving connection normally effected by said clutch means between said shafts;

c. clutch release bearing means normally spaced from said release levers and engageable with said release levers for effecting the disengagement of the driving connection between said shafts;

d. means for actuating the clutch assembly; and

e. means for automatically adjusting the space between said clutch release levers and said clutch release bearing means to a predetermined distance, said automatically adjusting means including:

i. a housing;

ii. first retainer means mechanically connected to said actuating means and movably disposed in said housing, said first retainer means having a hollow portion therein open at least one end and cam surfaces positioned on the inner surface of said hollow portion;

iii. a rod member for moving said clutch release bearing means relative to said clutch release levers, said rod member having a first portion with one end mechanically connected to said clutch release bearing means and a second portion disposed in said housing with one end movably positioned into said hollow portion through said open end of said first retainer means;

iv. at least one cam means disposed in said hollow portion between said first retainer means and said rod member for selective engagement and disengagement with said rod member in response to the relative movement between said cam means and said first retainer means, said cam means being urged into engagement with said rod member when acted upon by said cam surfaces of said first retainer means;

v. leaf spring means connected to said cam means for urging said cam means outwardly away from said rod member;

vi. second retainer means movably positioned in said

housing, slidable relative to said rod member, and operatively connected to said cam means by said leaf spring means;

vii. a pair of springs positioned in said housing for acting on opposing sides of said second retainer means, the biasing forces of said pair of springs being balanced when said second retainer means is in a predetermined neutral position; and

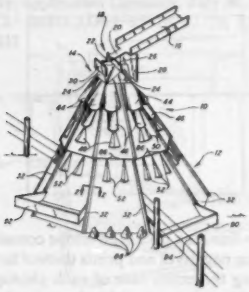
viii. spring means for biasing said rod member in the clutch disengaging direction.

4,057,136

GRAVITY FOR SOLID PARTICULATE MATTER

Arthur E. La Porte, Jr., 62 Thurlow Ave., Rochester, N.Y. 14609

Filed Aug. 12, 1976, Ser. No. 713,801
Int. Cl.² A01K *5/00*; B65G *11/20*
U.S. Cl. 193—3 **6 Claims**



1. A structure for distributing a supply of solid, particulate material into a plurality of discrete portions of predetermined relative size, said structure comprising:

a. an inclined chute having a discharge end adapted to deliver a supply of feed by gravity;

b. an upper distributing section having four gables with upper edges disposed in a common horizontal plane, all meeting at a single point, and a plurality of discrete surfaces sloping outwardly and downwardly from said single point, the latter being located below said discharge end and in such lateral relation thereto that a supply of particulate material delivered by gravity from said discharge end falls substantially symmetrically about said point and down each of said discrete surfaces; and

c. a lower distributing section having at least one external surface disposed below and sloping outwardly and downwardly from said upper distributing section, and a plurality of divider elements extending outwardly from said external surface at selected locations thereon, each of said elements having side surfaces diverging away from one another and from the plane of said external surface from an uppermost point substantially in said plane, whereby material sliding down said external surface is divided by said elements into a plurality of discrete portions of predetermined relative proportion.

4,057,137

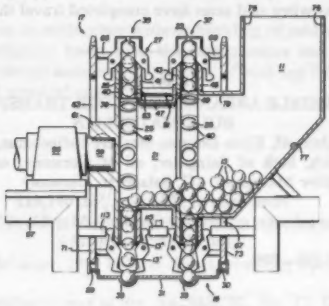
METHOD AND APPARATUS FOR FEEDING ARTICLES ONTO A MOVING CONVEYOR

Clarence M. Hansen, East Lansing, and Richard L. Ledebuhr, Haslett, both of Mich., assignors to Dura Corporation, Southfield, Mich.

Filed Dec. 29, 1975, Ser. No. 644,501
Int. Cl.² B65G *29/00*
U.S. Cl. 198—443 **6 Claims**

1. In an apparatus for conveying pieces of drupaceous fruit in spaced fruit-supporting cups mounted on a continuously moving conveyor, an improved rotary feed assembly for separating a flow of fruit from a hopper into individual pieces and for synchronously depositing said individual pieces into said fruit-supporting cups, the assembly comprising:

a plurality of rotatable feed wheels each of which includes a centrally hollow hub portion communicating to said hopper, each successive feed wheel hub from said hopper having a reduced internal diameter as compared to that of an adjacent feed wheel nearer the hopper to distribute said fruit among said feed wheels, a plurality of circumferentially spaced fruit discharge ports formed about the periphery of each said feed wheel, and a corresponding plurality of individual, radially extending feed passages communicating between a passage entry thereinto in said hub portion and said spaced ports, each said passage holding for movement therethrough at least two pieces of said fruit, each said hub portion adapted to receive a plurality of said pieces of fruit, the fruit being sorted into said passages and moved outwardly in said passages from the entry and toward said exit ports, and an outermost one of the pieces being maintained adjacent the discharge port



substantially throughout the rotation of its feed wheel at least partially be centrifugal force;

means for rotating said feed wheels to generate said centrifugal force and to synchronize the rotational velocity of the distal ends of said feed passages with the linear velocity of said moving conveyor;

the conveyor comprising a parallel pair of chains engaging said feed wheels and a plurality of plates carried on and between said chains and containing fruit receiving cups, each of said cups providing a space between said rotary feed wheels and said plates to allow said piece of fruit to be deposited thereinto; and

gating means normally blocking the exit of said outermost one of said pieces from each of said discharge ports of said feed passages and responsive to said port being operably positioned with respect to one of said fruit-supporting cups for unblocking said port and depositing an individual piece into said cup without relative motion therebetween during said depositing.

4,057,138

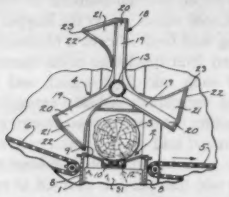
APPARATUS FOR ROUTING LOGS

Edward Andrew Grebe, Wauwatosa, Wis., assignor to Wisconsin Bridge & Iron Co., Milwaukee, Wis.

Filed Feb. 5, 1976, Ser. No. 655,635
Int. Cl.² B65G *47/00*
U.S. Cl. 198—480 **4 Claims**

1. An apparatus for routing logs to various locations, comprising a conveyor to convey logs in an end-to-end relation, a rotatable log kicker disposed above the conveyor and mounted for rotation about an axis disposed generally parallel to the direction of travel of the conveyor, said log kicker having a plurality of outwardly extending arms disposed to engage the log on the conveyor as the kicker is rotated in either direction

to move the log laterally to either side of the conveyor, reversible drive means operably connected to the log kicker and operable to rotate the arms through an arc of travel generally equal to the arc between adjacent arms, means operably connected to the drive means for operating said drive means at a



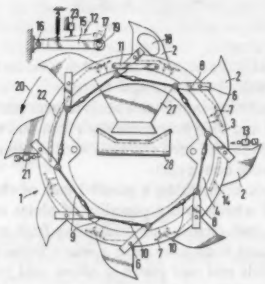
first speed through a first portion of said arc of travel and for operating said drive means at a second speed during a second position of said arc of travel, said second speed being slower than said first speed, and brake means for stopping rotation of said arms when said arms have completed travel through said arc.

4,057,139

REVERSIBLE ARRANGEMENT FOR TRANSPORTING BULK MATERIALS

Georg Mausolf, Klein Dohren; Herbert Bellenbaum, and Josef Dietrich, both of Salzgitter, all of Germany, assignors to Salzgitter Maschinen AG, Salzgitter, Germany

Filed June 1, 1976, Ser. No. 691,412
Claims priority, application Germany, May 31, 1976, 2524212
Int. Cl.[2] B65G *29/00*
U.S. Cl. 198—509 **20 Claims**



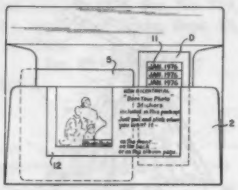
1. In an arrangement for transporting bulk materials, a combination comprising a support; transporting means mounted on said support for rotation in opposite circumferential directions about a central axis and including a bucket wheel, a plurality of buckets each having two inlet openings, and means for mounting each of said buckets on said bucket wheel for pivoting relative thereto about a pivot axis substantially parallel to said central axis between two end positions in each of which one of said openings faces in one of said circumferential directions, and for shared movement therewith in a circular path; means for rotating said transporting means in a transporting mode in which each of said buckets assumes a first end position with a respective opening thereof facing in the circumferential direction of movement of said buckets for entry of bulk material into said bucket through said respective opening, and in a reversing mode in which said buckets move in an opposite circumferential direction than during said transporting mode; and means for concurrently pivoting said buckets during said reversing mode from said first into a second end position of each of said buckets in which the other opening of the latter faces in said opposite circumferential direction, including detaining means arranged at a predetermined location along said path and operative for engaging a respective one of said buckets, means for actuating said detaining means into engagement with said respective bucket at said location to thereby discontinue the movement of said respective bucket in said path and pivot the same about said pivot axis during the continuing rotation of said bucket wheel in said opposite direction, and means for interconnecting said buckets for synchronized pivoting between said end positions thereof.

4,057,140

PHOTO-FINISHING PACKET WITH DATE STRIPS FOR PHOTOGRAPHIC PRINTS

Abraham Hutzel, Clinton, Md., assignor to Cullen Photo Service, Inc., Alexandria, Va.

Filed Apr. 26, 1976, Ser. No. 680,372
Int. Cl.[2] B65D *77/24, 85/30, 27/08*
U.S. Cl. 206—216 **3 Claims**



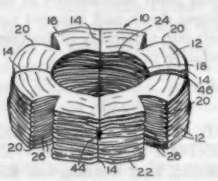
1. In a photo-finishing packet envelope containing a plurality of photographic negatives and prints thereof having the photographs covering the entire face of each photographic print, a unitary sheet of backing material and a strip of printed material coextensive with said sheet adhesively affixed with pressure-sensitive adhesive to one face of said backing material but readily strippable therefrom while retaining the adhesive on only the back face of said strip, said strip being scored incisively along a plurality of parallel lines to subdivide the strip into a plurality of small parts corresponding approximately in number to that of the photographic prints within the envelope, and with each part being imprinted identically with the date of the finishing operation, each of said small parts adapted to be affixed by the consumer, following its separation from the backing material, to a portion of each print to date the photograph for future reference.

4,057,141

BALED TIRE PRODUCT

Albert F. Laurie, 7239 N. Chase, Portland, Oreg. 97217, and G. W. Bunch, 11775 SW. Warner, Tigard, Oreg. 97223

Filed May 5, 1975, Ser. No. 574,595
Int. Cl.[2] B65D *85/06, 71/02*
U.S. Cl. 206—304 **12 Claims**



1. A baled tire product comprising a stack of rubber tires having the axes of their center openings in approximate alignment,

said stack being compressed in a direction along said axes into a short annular bale so as to maintain the alignment of said center openings,

said bale being maintained in its compressed condition by a

series of baling ties encircling the annulus of said bale at circumferentially spaced-apart positions thereon,

said bale having a series of openings spaced between said ties, each said opening extending generally radially inwardly from the outer circumferential periphery of said annulus from top to bottom thereof and terminating short of said central openings so as to expose the interior annular space within each said tire to ambient air and yet maintain the integrity of said bale.

4,057,142

PACKAGING OF SEMICONDUCTOR DISCS

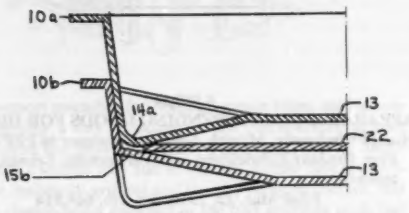
Günther Lechner; Karl Pritscher, and Helmut Kirschner, all of Burghausen, Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Germany

Filed July 26, 1976, Ser. No. 708,458

Claims priority, application Germany, July 30, 1975, 2534074

Int. Cl.² B65D *21/02, 65/16, 81/16, 85/30*

U.S. Cl. 206—332 **5 Claims**



1. A stackable plastic pallet assembly for packing semiconductor discs in a vertically-disposed stack of substantially identical pallets, comprising:

at least one stackable plastic pallet having a plurality of circular depressions, each of which may accommodate a semiconductor disc and means for releasably securing the discs in said depressions, said means comprising a plurality of part sector-shaped surfaces which surround and slope downwardly toward the center of said depressions on which the outermost rims of the discs may rest and a plurality of part sector-shaped surfaces which surround and slope upwardly toward the center of said depressions and which, upon stacking of said at least one pallet in a vertically-disposed stack of substantially identical pallets, cooperate with the downwardly sloping part sector-shaped surfaces of the pallet therebelow to clamp the outermost rims of the discs contained in the depressions of the lowermost pallet therebetween, thereby immobilizing the discs.

4,057,143

SHIPPING CARTON FOR PLUSH REELS

Theodore P. Kessler, Rancocas, N.J., assignor to Timron, Inc., Moorestown, N.J.

Filed Aug. 18, 1975, Ser. No. 605,442

Int. Cl.² B65D *85/66*

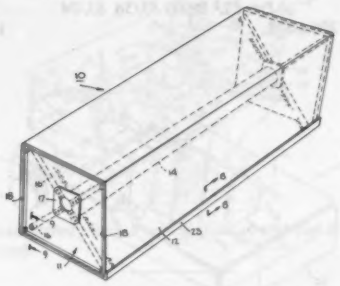
U.S. Cl. 206—400 **4 Claims**

1. A shipping carton comprising

a reel for pile fabric including a pair of end frames and a spacer bar disposed between said end frames, each end frame including an end board of polygonal shape having a peripheral ear projecting therefrom in perpendicular relation;

a cardboard sheet wrapper disposed about said reel, said wrapper having a pair of oppositely disposed side edges disposed about a said ear of a respective end board of said reel and pair of oppositely disposed terminal edges disposed in overlapping relation longitudinally of said reel, said terminal edges being unsupported from within the carton and being imperforate; and

adhesive securing said ears of said end frames to said side edges to said wrapper and said terminal edges of said



wrapper to each other without buckling of said wrapper said adhesive being such that the pressure required to complete the securement is capable of buckling the unsupported terminal edges.

4,057,144

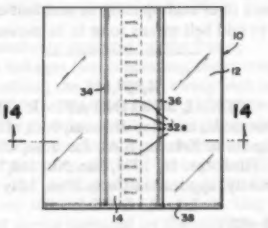
HIGH STRENGTH BAG FOR STORING MATERIALS IN STERILE CONDITION

Samuel J. Schuster, 1099 Hillside Street, Monterey Park, Calif. 91754

Continuation-in-part of Ser. No. 541,720, Jan. 17, 1975, abandoned. This application Nov. 25, 1975, Ser. No. 635,380

Int. Cl.² A61B *19/02;* **B65D** *33/16*

U.S. Cl. 206—439 **28 Claims**



1. A high strength, bacteria-impermeable, sealable bag for receiving material for sterilization after sealing of the bag by a process employing a sterilizing vapor, the bag comprising:

a container former of plastic sheet and having opposed faces and opposed transverse ends, one of the faces including overlapping longitudinal margins, the other face being continuous, the longitudinal margins being joined by a plurality of longitudinally-spaced heat seals defining between them passages for the sterilizing vapor; and

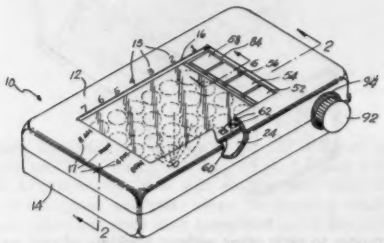
a membrane covering the longitudinal margins and passages and bonded to the container by continuous, longitudinally-extending heat seal joinder lines, the membrane being highly permeable to the sterilizing vapor, a transverse heat seal joinder line adjacent one of the transverse ends uniting the membrane and the container and closing one end of the bag, the other end being open to receive the material to be sterilized, the membrane being secured to the overlapping margins by the longitudinally-spaced heat seals.

4,057,145

COMPLIANCE DISPENSER FOR ORAL MEDICATION

Betty B. Wray, 3115 Ramsgate Road; Peter F. Stager, 2404 Kings Way, and Charles W. Linder, 501 Aumond Road, all of, Augusta, Ga. 30904

Filed Mar. 19, 1976, Ser. No. 668,537
Int. Cl.[2] B65D 85/56, 83/04
U.S. Cl. 206—538 15 Claims



1. A compliance dispenser for oral medication, which comprises:

means for containing a plurality of individual dosages of oral medication which includes dosage compartments arranged in groups, each group including a plurality of dosage compartments;

means for selecting one group of said dosage compartments from among said groups of compartments for allowing dispensation of said dosages therefrom, said selecting means comprising belt means movably disposed across said plurality of dosage compartments, said belt means having an opening formed therein which permits access only to one selected group of dosage compartments at a time; and

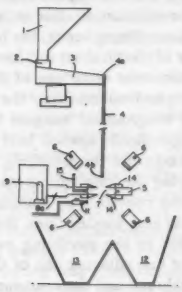
manually operable lid means for selectively permitting access to an individual dosage compartment within said selected group of dosage compartments, said lid means positioned over said opening in said belt means and connected to said belt means so as to be moveable therewith.

4,057,146

OPTICAL SORTING APPARATUS

Fernando Castaneda, and Roy Jimenez, both of San Jose, Costa Rica, assignors to Xeltron, S.A., Jan Jose, Costa Rica

Filed Apr. 16, 1975, Ser. No. 568,761
Claims priority, application Costa Rica, May 24, 1974, 2770
Int. Cl.[2] B07C 5/342
U.S. Cl. 209—75 18 Claims



1. Optical sorting apparatus for sorting objects falling over an unimpeded path in response to light reflected from said objects including,

a pair of light detecting means with different response characteristics producing a pair of light related signals,

processing means for integrating said pair of light related signals and for producing an output if a relationship between said integrated light related signals exceeds a first threshold,

comparator means receiving as an input, one of said pair of light related signals and producing an output if, and only if, said input signal lies outside of a predetermined range,

synchronization means responsive to one of said pair of light related signals and connected to said processing means and to said comparator means for enabling both said processing means and comparator means only in the presence of said one of said pair of light related signals, and

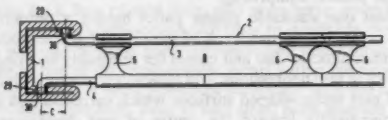
reject means responsive to output signals from both said processing means and said comparator means to reject an object if an output signal is provided by either said processing means of said comparator means.

4,057,147

APPARATUS FOR SUSPENDING GOODS FOR DISPLAY

Horst Fleischmann, Munich, Germany, assignor to PFP-Anstalt Fuer Produkt-Entwicklung und Verwertung, Schaan, Liechtenstein

Filed Mar. 22, 1976, Ser. No. 668,814
Claims priority, application Germany, Mar. 26, 1975, 2513493
Int. Cl.[2] A47F 7/19
U.S. Cl. 211—47 8 Claims



1. Apparatus for the spaced display of goods in suspended serial arrangement comprising:

carrier bracket means including at least two supporting legs extending parallel to one another from a support member, each of said supporting legs having at one end thereof a bearing pin, said support member having at least two bores, each said bearing pin being rotatably disposed in a said bore, spacer members removably disposed on said supporting legs, said spacer members having surface areas from which goods to be displayed can be suspended in spaced relationship over the length of said supporting legs, each said spacer member comprising a bridging portion having along one side thereof a socket for engaging one of said supporting legs and at the other side thereof a socket for engaging the other of said supporting legs, one of said sockets being of predetermined length and the other of said sockets being of a different length, said sockets each having one end lying in a common plane and the other end of one of said sockets lying in a plane that is spaced a perpendicular distance from said first mentioned plane, said bridging portion of each said spacer member including two oppositely facing, semi-circular surfaces extending between said sockets and a said socket on one side of said bridging portion having an opening facing in a predetermined direction with respect to said bridging portion and said socket on the opposite side of said bridging portion having an opening facing in a direction that is 90° from said predetermined direction.

4,057,148

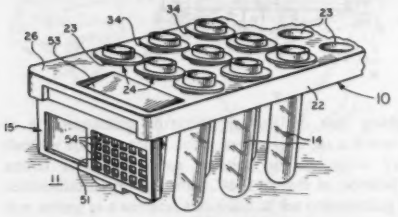
MULTIPLE SAMPLE SUPPORT ASSEMBLY AND APPARATUS FOR FACILITATING RADIOIMMUNOASSAYS AND THE LIKE

Rolf Meyer, Des Plaines, and John E. Burgess, Arlington Heights, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 483,024, June 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 292,738, Sept. 27, 1972, abandoned. This application July 17, 1975, Ser. No. 596,750

Int. Cl.² B01L *9/06*

U.S. Cl. 211—74 **8 Claims**



1. A support assembly for holding sample tubes, said assembly comprising: a tray including at least one aperture; at least one apertured and generally annular retaining device for disposition about a sample tube and in which a sample tube is insertable to be resiliently gripped and thereby retained therein, said retaining device being disposed in the tray aperture such that the retaining device and a sample tube inserted therein is freely suspended downwardly from the tray in a self-aligning substantially vertical orientation though in a manner allowing free-swinging orbital and angular movement within predetermined limits; said retaining device including a section which extends through and is dimensioned to loosely fit within the tray aperture, which section has an upper portion which overlaps the upper surface of the tray to effect retention and accommodation of the retaining device in the tray aperture and prevents same from falling through said aperture; said retaining device further including a resilient section which protrudes from the aperture below the tray, said protruding section including an enlarged shoulder portion of a diameter greater than that of the tray aperture, which shoulder portion is spaced from a lower surface of the tray and which shoulder portion defines means limiting the extent of movement of said retaining device in said aperture; said protruding section of said retaining device further including circumferentially spaced gripping portions which downwardly extend and which resiliently engage an inserted tube to adjustably retain the tube such that a vertical sliding displacement of an inserted tube relative to the retaining device and the tray can be effected upon the application of a predetermined force to the tube.

4,057,149

MECHANISM FOR TRANSFERRING PARTS

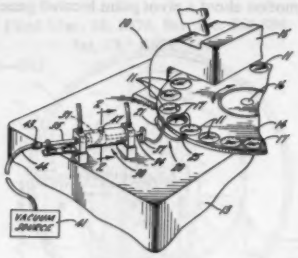
Frederick W. Clarke, Rockford, Ill., assignor to Rogers and Clarke Manufacturing Co., Rockford, Ill.

Filed Feb. 17, 1976, Ser. No. 658,416

Int. Cl.² B65G *47/91*

U.S. Cl. 214—1 BV **10 Claims**

1. Mechanism for picking up and transferring a part, said mechanism comprising a rod spiraled progressively around and along a straight line and defining a helix whose axis coincides with said line, means on one end of said rod and spaced radially from said axis, said means being selectively operable to first pick up and then release a part, and drive means connected to the other end of said rod for turning said rod about said axis while simultaneously advancing said rod in the direction of said axis whereby a part picked up by said selectively operable



means is transferred along a helical path as said rod is turned and advanced.

4,057,150

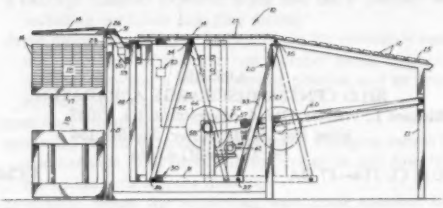
LUMBER STACKING APPARATUS

Sidney L. Lunden, c/o Lunden Industries, Inc., Bldg. N7D, Spokane, Wash. 99216

Filed Sept. 17, 1976, Ser. No. 724,325

Int. Cl.² B65G *57/10*

U.S. Cl. 214—6 DK **6 Claims**



1. A lumber stacking apparatus, comprising:

a frame;

a carriage operatively mounted on the frame;

parallelogram linkages interconnecting the carriage and the frame for enabling the carriage to swing back and forth in an arcuate path between a course pick-up station and a course stacking station while maintaining the carriage horizontal during the swinging movement;

carriage drive means operatively connected to the carriage for moving the carriage back and forth between the course pick-up station and the course stacking station;

course support means mounted on the carriage for vertical movement with respect to the carriage for carrying a lumber course from the course pick-up station to the course stacking station; and

means operatively connected to the course support means for (1)

elevating the course support means at the course pick-up station to pick up a course of lumber, and (2) maintaining the course support means elevated while the carriage is being swung from the course pick-up station to the course stacking station to carry the course of lumber to the course stacking station.

4,057,151

SILO UNLOADER AND APPARATUS THEREFOR

Richard L. Weaver, Rte. 1, Myerstown, Pa. 17067

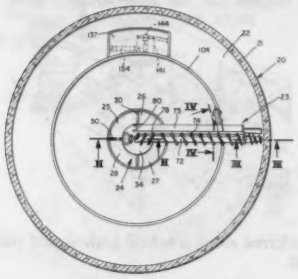
Filed Jan. 18, 1972, Ser. No. 218,736

Int. Cl.² A01F *25/20*; B65G *65/46*

U.S. Cl. 214—17 DA **21 Claims**

15. Apparatus for use in unloading a silo from the bottom thereof through a generally central opening therein, compris-

ing an auger, means mounting the auger for generally radial disposition, means for rotatably driving the auger about its own generally radial axis, and means for driving the auger in a sweeping motion about a pivot point located generally radially



inwardly of the auger, and means for lubricating both said driving means from beyond the radial outermost end of the auger, outside the silo with which the apparatus may be associated.

4,057,152

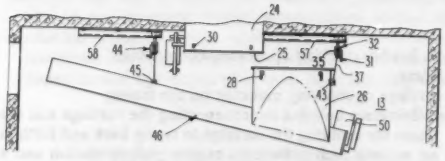
SILO CENTER DISCHARGE APPARATUS

Richard L. Weaver, Rte. 4, Myerstown, Pa. 17067

Filed Dec. 15, 1975, Ser. No. 641,154

Int. Cl.² B65G *65/46*

U.S. Cl. 214—17 DA **4 Claims**



1. In a silo unloader of the bottom unloader type wherein a rotary auger is utilized to sweep across the floor of a silo to engage silage and wherein the auger rotates on its own axis employing flitting on the auger to convey silage radially inwardly of the silo to a silo discharge opening located generally centrally of the floor of the silo, the improvement comprising a generally centrally located fixedly mounted upper discharge chute and a movable lower discharge hopper disposed beneath said upper discharge chute, and means facilitating lateral displacement of said hopper relative to said chute, including means for lowering said hopper relative to said chute and including means detachably connecting said chute and hopper together, wherein lower means are provided beneath the floor of the silo for conveying silage discharged through the chute and hopper outwardly of the silo, wherein said hopper and said lower means for conveying are connected for lateral displacement and vertical lowering movement together as a unit, wherein track means are provided, connected to any of said hopper and said lower conveying means for facilitating their lateral displacement, and wherein track means comprise a pair of tracks with wheel-like means therein, the tracks being fixedly carried beneath the silo floor and the wheel-like means being movable therein.

4,057,153

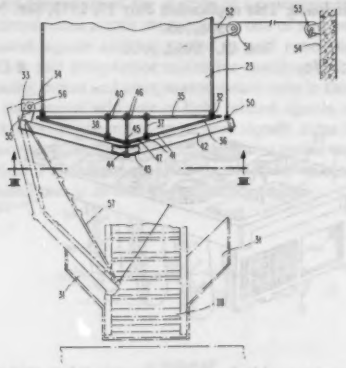
SILO CENTER DISCHARGE MECHANISM

Richard L. Weaver, Rte. 4, Myerstown, Pa. 17067

Continuation-in-part of Ser. No. 526,690, Nov. 25, 1974, Pat. No. 3,977,543, which is a division of Ser. No. 354,496, April 26, 1973, Pat. No. 3,874,524. This application Nov. 26, 1975, Ser. No. 635,394

Int. Cl.² B65G *65/46*

U.S. Cl. 214—17 DA **10 Claims**



1. In a silo bottom unloader wherein a generally radially disposed auger is pivotally mounted inside the silo for sweeping across the bottom of the silo while rotating and delivering silage to a generally centrally located bottom discharge passageway for subsequent delivery of the silage to a conveyor mechanism that carries silage outwardly of the silo, the improvement comprising a bottom closure for the passageway, said closure comprising a pivotally openable door sealing means for sealing said door relative to the lower end of said passageway, said door having a generally flat surface in a closed generally horizontal sealing position of said door, said door having a support mechanism therebeneath pivotally disposed relative to the lower end of said passageway, said flat surface comprising a combination sealing surface and lateral deflection means for deflecting silage delivered through said passageway, laterally thereof, wherein said passageway comprises a generally circular lower end, wherein said upper surface of said door is mounted on and carried by said support mechanism, and including a generally conical member disposed beneath said horizontal surface member and by which said horizontal surface member is carried, and wherein said support mechanism comprises a frame member traversing said conical member therebeneath, including means generally rigidly connecting said horizontal surface member and said frame member

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4,057,154

REFUSE COMPACTING VEHICLE

Allen Abram Neufeldt, 85 Nymark Avenue, Willowdale, Ontario, Canada (M2J 2H1)

Filed Feb. 24, 1977, Ser. No. 771,571

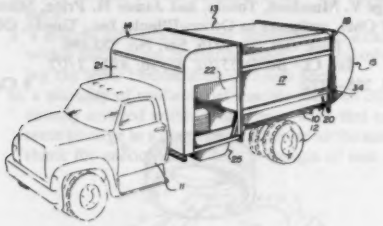
Int. Cl.² B65F *3/00*

U.S. Cl. 214—82 **11 Claims**

1. In a self-loading refuse carrier, the combination with a motor vehicle having a compartment adapted to receive and compact refuse therein, of a loading and compacting mechanism comprising:

a pusher-blade extending across a lower portion of said compartment between opposite sidewalls thereof, means for moving said pusher-blade horizontally backward and forward between a refuse-receiving position and a refuse-compacting position, a bucket pivotally mounted along the upper edge of said blade for pivotal movement between a lower refuse-receiving position and an upper

refuse-discharging position, at least one cam wheel articulated between the bucket and the blade by means of pivotal arms, and a cam guideway forming an inclined path between a lower refuse-receiving position and an upper refuse-discharging and compacting position, whereby said cam wheel in response to movement of said pusher-blade



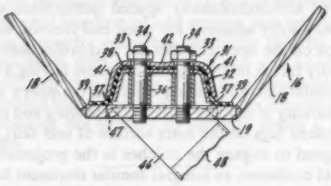
in a compacting direction travels up said guideway, thereby forcing said bucket to swing from a lower horizontal refuse-receiving position to an upper vertical refuse-discharging position, said bucket in vertical position acting as a vertical extension of the compacting blade with continued movement of the blade in compacting direction.

4,057,155

RAILROAD CAR

Ronald George Deeks, Oakville, Canada, assignor to Procor Limited, Oakville, Canada

Filed Nov. 4, 1976, Ser. No. 738,520
Int. Cl.² B60P *1/60*
U.S. Cl. 214—83.28 **13 Claims**



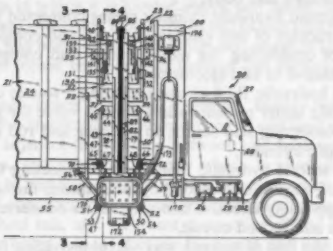
1. A container for powdered material having a surface sloping toward a bottom outlet opening, and means for aerating said material to cause discharge through said outlet opening, comprising: a pair of separate, correspondingly shaped, clamping members, one of which is nested within the other; means spacing the lower terminal edges on opposing sides of each of said clamping members slightly above said sloping surface so as to define a pair of spaced gas gaps between said terminal edges of each clamping member and said sloping surface on opposite sides of said clamping members; flexible, gas-impervious sheet material clamped between said clamping members and having a pair of spaced portions extending beyond said terminal edges into contact with said sloping surface on opposite sides of said clamping members that each portion of sheet material seals one of said spaced gas gaps; means for attaching said clamping members to said container and causing said clamping members to immobilize said sheet material except for said pair of portions extending beyond said terminal edges and sealing said spaced gas gaps; and means for forcing pressurized gas between said clamping members and said sloping surface so as to cause said spaced portions of said sheet material to flutter as said gas escapes therebetween through said spaced gas gaps into said powdered material.

4,057,156

LIFTING ARM APPARATUS

Vern C. Thompson, Minneapolis, and John A. Riggle, Minnetonka, both of Minn., assignors to Reuter, Inc., Hopkins, Minn.

Filed Mar. 15, 1976, Ser. No. 666,886
Int. Cl.² B65F *3/02*
U.S. Cl. 214—302 **6 Claims**



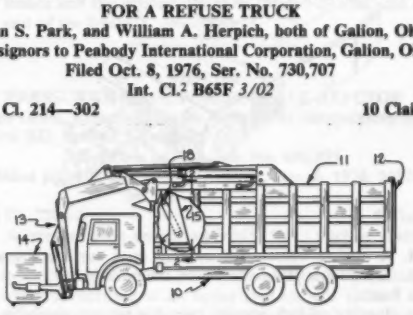
1. Material handling apparatus comprising, in combination:
a vehicle having a body with a top opening;
a generally vertical track member pivoted about a vertically movable horizontal axis near the top of said body, and including first and second pairs of guidance surfaces;
a carriage member movable along said track member and including container engaging means;
drive means including an endless chain for reversibly causing movement of said carriage member along said track member between a lower extreme position and an upper extreme position;
container engaging means;
mounting means securing said container engaging means on said carriage for a limited lifting extension and lowering retraction with respect thereto;
reversible means for supporting said track member and causing pivotal movement thereof to extend said mounting means so as to bring said container engaging means into engagement with a container resting on the ground;
means releasably operable to maintain said engagement;
and reversible means including said track member for causing pivotal movement of said carriage, at the upper extreme position thereof, whereby an engaged container is inverted into said body.

4,057,157

LOAD COMPACTING AND EJECTING MECHANISM FOR A REFUSE TRUCK

Glenn S. Park, and William A. Herpich, both of Galion, Ohio, assignors to Peabody International Corporation, Galion, Ohio

Filed Oct. 8, 1976, Ser. No. 730,707
Int. Cl.² B65F *3/02*
U.S. Cl. 214—302 **10 Claims**



1. A load compacting and ejecting mechanism for a refuse truck that has a hollow rectangular body, an openable tailgate at the rear of the body and a refuse receiving opening near the front of the body, said mechanism comprising, in combination:
a. a generally vertical ejector plate which extends across said

body and is guided for movement between the front and rear of said body,

b. a centrally located compaction plate mounted on said ejector plate for movement between a forward position in which it constitutes a part of the ejector plate surface and a position rearwardly of the surface of said ejector plate,

c. main hydraulic cylinder means connected between the front of said body and the structure of said compaction plate for moving said ejector and compaction plates through said body,

d. second hydraulic cylinder means connected between the structure of said ejector plate and said compaction plate for controlling the movement of said compaction plate relative to said ejector plate,

e. a hydraulic fluid circuit including a source of hydraulic fluid under pressure and a control valve for alternatively connecting said source to the base and rod ends of said main cylinder,

f. a second hydraulic fluid circuit connecting the base and rod ends of said second cylinder means through a pair of oppositely effective one-way valves connected in parallel in said second circuit,

1. the first of said one-way valves providing for fluid flow from the base end to the rod end of said second cylinder means,

2. the second of said one-way valves normally being closed for preventing fluid flow from the rod end to the base end of said second cylinder means and including pressure responsive means for the opening thereof, and

g. means connecting the pressure responsive means of said second one-way valve to the base end of said main cylinder means,

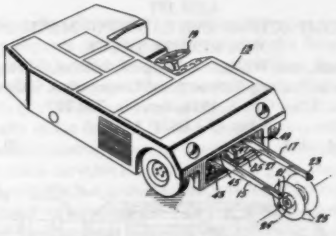
whereby when the resistance to rearward movement of said ejector plate and said compaction plate causes the pressure in the base end of said main cylinder means to reach a predetermined level, said second one-way valve is opened thereby and said main cylinder means moves said compaction plate rearwardly of the surface of said ejector plate, thus the second hydraulic cylinder plus said pair of one-way valves serves as a lock to either lock the movement of said compaction and ejector plates or allow relative movement therebetween.

4,057,158

AIRCRAFT TOWING VEHICLE

Igor Lissy, 115 S. Ivy Lane, Glen Mills, Pa. 19342

Filed June 1, 1976, Ser. No. 691,741
Int. Cl.[2] B60B *29/00*
U.S. Cl. 214—330 **22 Claims**



1. A towing vehicle for moving on a surface a towable vehicle having a pivotable wheel, comprising:

a frame;

a plurality of individually steerable wheels pivotally connected to said frame;

hitch means extending from said frame and formed to engage the pivotable wheel for maintaining the axes of said pivotable wheel fixed relative to said frame; and

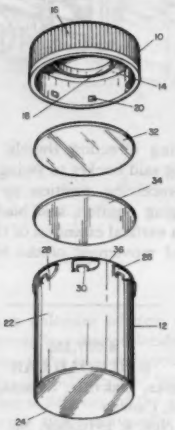
steering means operatively connected to said towing vehicle wheels responsive to a steering command for separately positioning each towing vehicle wheel, the axes of all said towing vehicle wheels and the pivotable wheel intersecting at a common point.

4,057,159

VAPOR-SEAL SAFETY CAP AND CONTAINER

William E. Fillmore, Toledo; Wayne E. Garver, Sylvania; George V. Mumford, Toledo, and James H. Price, Maumee, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 18, 1976, Ser. No. 733,690
Int. Cl.[2] B65D *55/02, 85/56;* A61J *1/00*
U.S. Cl. 215—222 **6 Claims**



1. a vapor-sealing, child-resistant closure and container combination comprising: an open-mouthed container having a plurality of circumferentially spaced projections extending radially outwardly adjacent the open end thereof, an annular rim portion on the open end thereof, said projections having a downwardly facing notch therein; a closure having a top panel and an annular skirt depending from the periphery of the top panel, a plurality of radially inwardly extending and circumferentially spaced lugs on the inner surface of said skirt, said lugs being adapted to engage the notches in the projections on the skirt of said container, an integral annular abutment formed on, and depending from, the inner surface of the top panel of said closure; and a liner sytem carried by said closure, including a first liner member formed from a flexible and resilient material interposed between the free edge of the annular abutment and the lugs on the skirt of the closure, and a second liner layer formed from a deformable material underlying said first liner layer between the free edge of the annular abutment and the lugs on the skirt of the closure; said annular abutment adapted to bias said first resilient liner layer downwardly to force said second deformable liner layer into vapor-sealing engagement with the annular rim on said container, when the lugs on said closure are engaged within the notches in the projections on the skirt of the container.

4,057,160

SELF-RETAINING BOTTLE STOPPER

George Victor; Robert G. Fisher, and Kaspar Bischof, all of Modesto, Calif., assignors to E. & J. Gallo Winery, Modesto, Calif.

Filed Feb. 2, 1976, Ser. No. 654,326
Int. Cl.[2] B65D *41/06, 41/28*
U.S. Cl. 215—318 **4 Claims**

1. In combination, a self-retaining bottle stopper and a finish of a bottle adapted to contain pressurized contents:

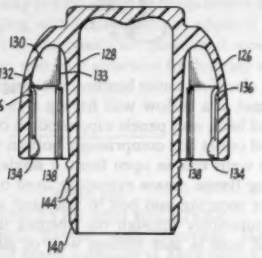
a. said finish comprising a tubular neck having an annular top margin about the opening thereof, an inner circumference, an outer circumference and a plurality of straight, helical ribs of uniform width and height, each of said helical ribs partially circumscribing said outer circumference and defining partially overlapping thread zones;

b. said stopper comprising:

i. a cup-shaped crown defining a skirt for capping said neck;

ii. a hollow cylindrical shank depending co-axially from within said crown, including means for sealably engaging the inner circumference of said neck;

iii. a plurality of resilient, deformable webs all circumferentially arrayed within said crown, such that each presents an edge in a plane perpendicular to the axis of said shank for encountering the top margin of said necks;



iv. a plurality of lugs projecting radially inwardly from said skirt and annularly aligned in a plane perpendicular to said shank and adapted to lockingly confront said ribs on the lower side from said top margin;

v. said web edges and said lugs being spaced relative to said top margin and said lower rib side furthest from said top margin such that at least two of said lugs lockingly encounter said lower rib side of selected ribs upon full axial insertion of said stopper into said finish; and

vi. an inwardly extending relatively thin fin integrally associated with each of said lugs and axially aligned with respect to the axis of said shank, each said fin being adapted to collapsibly deform to the contour of a corresponding rib, thereby to partially define a rib thread path.

4,057,161

LIFTING AND HANDLING APPARATUS

Gavin Boyce Youl, 57 Clarence Street, Perth 7300, Tasmania, Australia

Filed May 12, 1976, Ser. No. 685,621

Claims priority, application Australia, May 13, 1975, 1581/75; July 17, 1975, 2392/75

Int. Cl.² E02F 3/00

U.S. Cl. 214—777 **5 Claims**

1. Lifting and handling apparatus including:

a frame having ground engaging means, at least part of which is located adjacent one end of said frame, said part including a pair of ground engaging wheels, each wheel having its axis of rotation located substantially the same distance from said one end of the frame;

load support means comprising a base section and a back section which is secured to and is upstanding from a rear edge portion of said base section;

linkage means connecting said load support means on said frame so that said load support means is movable relative to said frame between a loading position in which it projects beyond one end of said frame, and a carrying position in which it is located above said frame; and

drive means connected to said frame and to said load support means, and being operable to cause movement of said load support means between said loading and carrying positions;

said linkage means including a primary linkage which is pivotally connected to said frame and to said load support means adjacent the junction between said base and back sections, and a control linkage which is pivotally connected to said frame and to said back section, each of said pivotal connections having its axis substantially parallel to said wheel axis, and the frame connection of said control linkage being located further from said one end of the frame than is the frame connection of said primary linkage;

each said linkage means including two arms, each of which is located adjacent a respective opposite side of said frame, each said control linkage arm comprising an upper section connected to said load supporting means and a lower section connected to said frame, said arm sections being arranged in end to end relationship and being pivotally connected at their adjacent ends, the said upper arm section being of substantially the same length as each of said primary linkage arms; and restraining means acting between each said lower arm section and said frame during a first part of the movement of said load support means from said loading position, whereby said lower arm sections are held stationary relative to said frame, and being arranged to have no influence on said lower arm section during a second part of said movement from said loading position;

said linkage means interacting between said frame and said load support means so as to automatically cause lifting and tilting of said load support means during said movement thereof from said loading position to said carrying position, whereby in said loading position said base section is substantially horizontal so as to be adapted to receive a load thereon, and in said carrying position both said base and back sections slope relative to the horizontal to define a load retaining channel between them, and the junction of said base and back sections is located above and forwardly of the zone of engagement between said ground engaging means and the ground which is located nearest said one end of the frame.

4,057,162

PRESSURE VESSEL FOR NUCLEAR REACTOR

Heiko Gross, Krefeld, Germany, assignor to Siempelkamp Giesserei KG, Krefeld, Germany

Filed Dec. 5, 1975, Ser. No. 638,075

Claims priority, application Germany, Dec. 6, 1974, 2457661

Int. Cl.² B65D 45/32

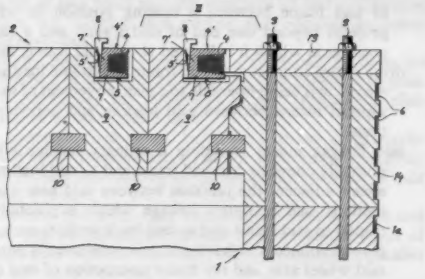
U.S. Cl. 220—3 **6 Claims**

1. A pressurizable vessel, especially for a nuclear reactor, comprising:

a cylindrical shell and a cover mounted on said shell, said cover comprising at an upper side thereof at least two continuous radially spaced concentric annular grooves;

respective annular prestressing arrangements with respective prestressing cables received in said grooves, each of said arrangements comprising a U-section support element open toward the outer periphery of said cover and received in the respective groove, said element of each arrangement receiving the prestressing cables thereof;

wedges received between each element and a wall of the respective groove for maintaining the cables of the respective arrangement under a predetermined stress, said cover comprising a plurality of concentric rings each formed with at least one such groove and receiving a respective



prestressing arrangement, at least some of said rings bearing inwardly upon neighboring rings, the neighboring rings being formed with confronting recesses; and

keying means form-fitting in said recesses for preventing relative displacement of said rings in a direction transverse to the cover.

4,057,163

METAL CONTAINER WITH THICK WALLS

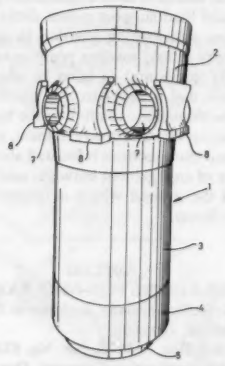
Jean E. L. Widart, Saint Severin, and Alain F. C. Scailteur, Liege, both of Belgium, assignors to Cockerill-Ougree-Providence et Esperance-Longdoz en abrege "Cockerill", Seraing, Belgium

Filed July 8, 1976, Ser. No. 703,344

Claims priority, application Belgium, July 8, 1975, 45082; Feb. 20, 1976, 164487

Int. Cl.[2] B65D *7/42*

U.S. Cl. 220—3 **2 Claims**



1. In a forged metal cylindrical nuclear reactor pressure vessel including a core shell course portion, a nozzle shell course portion welded to one end of the core shell course portion, and a bottom cap closing off the other end of the core shell course portion, the improvement wherein: said nozzle shell course portion comprises an integral, forged wall portion of enlarged thickness and defining a radially outward projecting nozzle and support ring, said nozzle and support ring being machined at circumferentially spaced locations to define circular nozzles separated by integral radially projecting support means with said support means and said nozzles occupying a common circumferential plane.

4,057,164

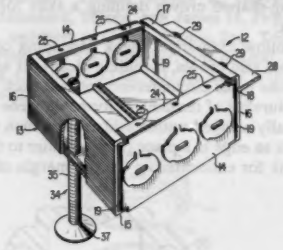
ELECTRICAL OUTLET BOX MOUNTING

William Maier, 125 Lawlor Terrace, Stratford, Conn. 06497

Filed Feb. 20, 1976, Ser. No. 659,893

Int. Cl.[2] H02G *3/12*

U.S. Cl. 220—3.6 **8 Claims**



1. An electrical outlet box for mounting in an opening in the front panel of a hollow wall having a yieldable wall stud and front and back wall panels supported on opposite sides of said stud, said outlet box comprising a bottom wall, a pair of opposite side walls and an open front, a single laterally projecting mounting flange means extending from one only of said side walls for securing said box to said stud with said open front facing outwardly through the opening in the front panel, a threaded hole in said bottom wall of said box adjacent the other of said side walls, and leveling means for adjusting the level of the box by moving said other side of said box relative to said one side of said box when said one side is secured to said stud by its mounting flange, said leveling means comprising a leveling screw extending through said threaded hole in threaded engagement therewith, said leveling screw being adjustable inwardly and outwardly of said box to engage the back wall panel and give support to said box adjacent the side of said box opposite the side from which the mounting flange projects.

4,057,165

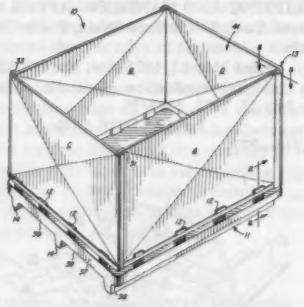
REUSABLE FOLDING CONTAINER

Kurt J. Kardell, 115 Industrial Drive, Tempe, Ariz. 85281

Filed Apr. 21, 1977, Ser. No. 789,361

Int. Cl.[2] B65D *7/24, 5/20*

U.S. Cl. 220—6 **11 Claims**



1. A collapsible shipping and storage container comprising:

a four-sided base structure,

four panel members each mountable on a different edge of said base structure,

hinge means, one for interconnecting each of said panels to a different edge of said base structure,

each of said hinge means comprising a resilient member

connected at one end to one of said panel members and at the other end to a different edge of said base structure,

said resilient member being provided with a plurality of spaced slots extending longitudinally of an edge of said base structure outwardly of said container and part way through said resilient member,

the pivotal axis of each hinge means being arranged along a different slot thereof from a reference point on said base structure to pivot inwardly of the juxtapositioned edge of the base structure over a common surface of it to a position substantially parallel with said surface,

said pivotal axis of the four hinge means being mounted sequentially each at a greater distance substantially equal to the thickness of the associated panel than the preceeding one from said reference point, and

fastening means mounted along parallel edges of said panels which are laterally positioned to its hinge means for cooperatively engaging with juxtapositioned edges of adjacent panels when all of said panels are positioned substantially perpendicular to said base structure for holding said panels in container erected position.

4,057,166

DRAWER TYPE ASH RECEIVER

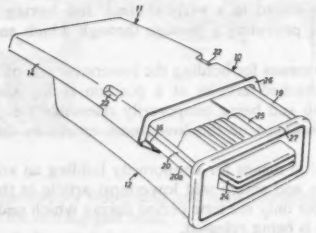
Shinichiro Yamazaki, Toyota, and Teruyuki Hanabashi, Owariasahi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 22, 1976, Ser. No. 734,726

Claims priority, application Japan, Oct. 31, 1975, 50-149534[U]

Int. Cl.² B65D *7/24, 43/20*; A24F *19/00*

U.S. Cl. 220—8 **8 Claims**



1. In an ash receiver assembly comprising a container in the form of a drawer and a supporting member from which the container is telescopically suspended and which provides a cover over said container when the latter is in a fully-closed position;

the improvement wherein the supporting member has a front end and a rear end and includes, in one piece, opposite-spaced side flanges, each having a forward end, and a rear end flange, the spaced side flanges being flared downwardly and outwardly and extending substantially along the whole length of said container, and a pair of receiving arms which extend inwardly from respective forward ends of the side flanges, each of the receiving arms having resilient means thereon; said container has opposite-spaced side rim means to engage with the flared side flanges and rear end rim means to engage with the rear end flange, the side rim means having outer tapered surfaces which are slidably guided by the flared side flanges of said supporting member and which are urged upwardly from lower surfaces thereof by the resilient means on said receiving arms to ensure air-tightness of said container when the latter is in the fully-closed position.

4,057,167

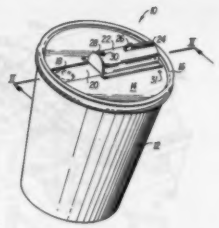
VALVED RECEPTACLE CLOSURE

Jin Ku Lee, 8108 Gorman Ave., No. 229, Laurel, Md. 20810

Filed Dec. 1, 1976, Ser. No. 746,604

Int. Cl.² A47G *19/22*; B65D *51/18, 43/20*

U.S. Cl. 220—90.4 **15 Claims**



1. A closure adapted to be mounted in a cover of a fluent material receptacle, said cover having an opening which communicates with the fluent material in the receptacle, said closure comprising valve means movable from a first position closing said opening to a second position exposing said opening, mounting means on said cover for slidably engaging said valve means with respect to said cover, resilient means for urging said valve means into said second position, and latch means operatively connected to said valve means for releasably securing said valve means in said first position against the force of said resilient means.

4,057,168

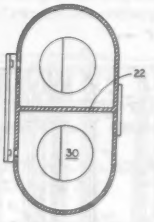
VENTED TEST TUBE TOP

Barry L. Bosshold, 115 Shelter Lagoon Drive, Santa Cruz, Calif. 95060

Filed July 7, 1975, Ser. No. 593,328

Int. Cl.² B65D *51/16, 51/18*

U.S. Cl. 220—209 **5 Claims**



1. A vented top for a test media container comprising:

a holder body adapted to be grasped in the hand;

a pair of openings through said body;

means in each of said openings for gripping a laboratory test media container therein:

a cap hingedly carried on said body for pivotal movement between a closed position covering said pair of openings and an open position displaced therefrom to enable access thereto;

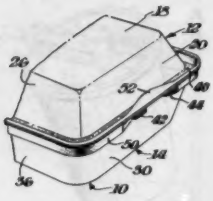
means on said cap for sealing off said openings in isolation from each other; and

venting means on said cap for each of said openings enabling the release of gases from said each opening to the exterior.

4,057,169
DUAL TONGUE AND SLOT CONTAINER LOCK

Joe R. Payne, La Habra, Calif., assignor to Keyes Fibre Company, Waterville, Maine

Filed Feb. 17, 1977, Ser. No. 769,567
Int. Cl.[2] B65D *41/18*; A47J *41/00*; B65D *1/00*
U.S. Cl. 220—306 10 Claims

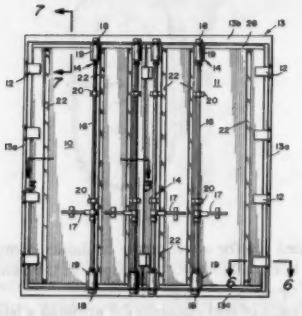


1. A container including two mating portions capable of packaging a product therebetween in the closed position, one of the portions having an inwardly flexible side wall with a laterally outwardly directed locking tongue protruding from its closeable edge, the other portion having a skirt along its corresponding closeable edge which overlies the closeable edge of the one portion in the closed position, an inwardly directed recess in the skirt located in opposition to the locking tongue, the improvement comprising a pair of slots in the recess separated from each other by an interconnecting web and a notch bifurcating the locking tongue into two protruding sections whereby each bifurcated section of the tongue is inserted in one of the slots in the recess and the notch accommodates the web of the recess to lock the two portions together in the closed position, and the two portions of the container may be unlocked by flexing the side wall of the one portion inwardly to withdraw the tongue sections from the slots in the recess of the other portion to permit the container to be opened.

4,057,170
CARGO CONTAINER DOOR CONSTRUCTION

Robert S. Dougherty, Upper Ames Ave., Ross, Calif. 94957

Filed Aug. 23, 1976, Ser. No. 716,700
Int. Cl.[2] B65D *45/28*, *51/18*
U.S. Cl. 220—323 8 Claims



1. A cargo container door, comprising:

a formed sheet metal skin having a plurality of formed corrugations extending vertically from top to bottom, and having left and right vertically extending edges formed into an outer lip with a recess at the inner side of the lip;

a stiffener bar welded onto each of the upper and lower edges and extending throughout the width of the door, said bar being of approximately the same inside-to-outside thickness as, and generally flush with, the left and right edge lips; and

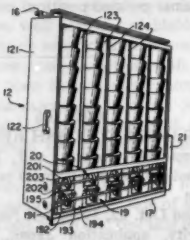
means forming closed off ends on the corrugations at the upper and lower edges;

whereby a generally uniform lipped edge is provided around the periphery of the door for receiving a sealing gasket, the upper and lower edges are sufficiently stiff to provide a sturdy door construction with a relatively thin sheet metal skin, and all surfaces of the door are open and accessible.

4,057,171
ARTICLE STORAGE DEVICES WITH ARTICLE RELEASERS FOR USE IN VENDING MACHINES

Kunitake Hatori, Maebashi; Toshihiko Ozaki, and Ryohei Kondo, both of Isesaki, all of Japan, assignors to Sankyo Electric Company Limited, Isesaki, Japan

Filed July 21, 1976, Ser. No. 707,210
Int. Cl.[2] B65G *3/44*
U.S. Cl. 221—6 11 Claims



1. An article storage unit device with means for discharging one article at a time for use in a vending machine, comprising a housing defining at least one article storing space in which articles are stored in a vertical stack and having a bottom opening for providing a passage through which an article is discharged,

first stop means for holding the lowermost one of said vertically stacked articles at a position facing said bottom opening and being temporarily releasable for permitting the discharge of the lowermost article in the vertical stack,

second stop means for temporarily holding an article adjacent to and above said lowermost article in the vertical stack for only the time period during which said first stop means is being released,

driving means for temporarily driving said first stop means to be released and contemporaneously driving said second stop means to hold, whereby only one lowermost article in the vertical stack is discharged from said bottom opening,

said first stop means comprising first cam means mounted on a first driving shaft, said first cam means permitting articles in said article storing space to pass when disposed at a first predetermined angular position by the rotation of said first driving shaft and engaging with and holding the article when disposed at a second predetermined angular position by the rotation of said first driving shaft, said second means comprising second cam means mounted on a second driving shaft, said second cam means permitting articles in said article storing space to pass when disposed at a predetermined angular position by the rotation of said second driving shaft and engaging with and holding the article when disposed at a second predetermined angular position by the rotation of said second driving shaft, and said first and second driving shafts being operatively and commonly connected to said driving means with an angular difference therebetween whereby said second cam means holds an article during the time said first cam means permits articles to pass, and

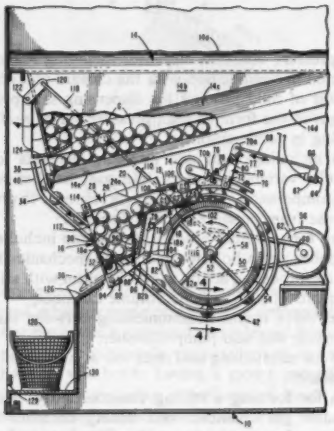
first and second plate means movably mounted to follow the cam contour of said first and second cam means, respectively, said first plate means being operable to engage an article when said first cam means is disposed in said second predetermined angular position and to release the article when said first cam means is disposed in said first predetermined angular position, and said second plate means being operable to engage an article when said second cam means is disposed in said second predetermined angular position and to release the article when disposed in said first predetermined angular position.

4,057,172

APPARATUS FOR DISPENSING GOLF BALLS

Harvey F. Olander, Corpus Christi, Tex., assignor to Gustafson Mfg. Co., Corpus Christi, Tex.

Filed July 29, 1976, Ser. No. 709,725
Int. Cl.[2] B65H *33/14*
U.S. Cl. 221—10 **19 Claims**



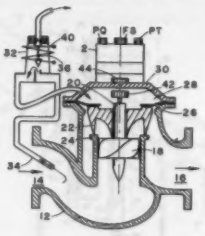
1. An apparatus for dispensing golf balls comprising:
a hopper for storing golf balls;
a receptacle for retaining a predetermined number of golf balls in position for dispensing, said receptacle having an openable and closable gate normally closing one end thereof;
means for guiding and conveying golf balls from the hopper to the receptacle, said guiding and conveying means comprising:
a wheel rotatable about a substantially horizontal axis and having a resilient outer circumferential surface, and
a passageway of a width slightly greater than the diameter of a golf ball, one end of said passageway being adjacent the hopper and the other end thereof being adjacent the receptacle, said passageway terminating in an at least part-circular portion substantially concentric with the wheel periphery, said at least part-circular portion terminating at the other end of the passageway adjacent the uppermost portion of the wheel and having a bottom spaced from the wheel periphery by a distance slightly less than the diameter of a golf ball, and
means for rotating said wheel to refill said receptacle until a predetermined number of golf balls are in said receptacle after said gate is closed after discharge of golf balls therefrom.

4,057,173

ELECTRICAL CONTROL SYSTEM FOR AUTOMATIC METERING VALVE

Aharon Tal, 131 Hanassi Street, Chof Yam, Herzlia, Israel

Filed Apr. 6, 1976, Ser. No. 674,284
Claims priority, application Israel, Apr. 8, 1975, 47049
Int. Cl.[2] B67D *5/30*
U.S. Cl. 222—20 **11 Claims**



11. A control system for an automatic metering valve delivering a preset quantity of a fluid and including a housing for the valve; a rotary impeller disposed within the housing and rotatable at a velocity in accordance with the rate of delivery of the fluid; and an automatic shut-off mechanism for turning-off the valve when the present quantity of fluid has been delivered; said control system including sensible element disposed internally of the valve housing and rotated with the impeller, a sensor sensing element to produce electrical signals corresponding to the number of rotations thereof and of the impeller, a presettable counter circuit effective to count said electrical signals, and a switching circuit effective to actuate the valve shut-off mechanism to turn-off the valve when the counter circuit reaches a preset number corresponding to the present quantity of fluid to be delivered; said switching circuit including: a capacitor having a charging circuit and a discharging circuit; a switching device in the capacitor discharging circuit and have a control electrode effective to fire the switching device and thereby to cause the capacitor to discharge; and a relay having a winding in the capacitor charging circuit and a pair of contacts in the capacitor discharging circuit, and contacts being normally closed when the capacitor is charged and the relay coil draws little current, and being automatically opened to interrupt the connection to the switching device when the capacitor has discharged causing the relay winding to draw a larger amount of current for recharging the capacitor.

4,057,174

MEASURING LIQUID DISPENSER WITH FLAT TOP

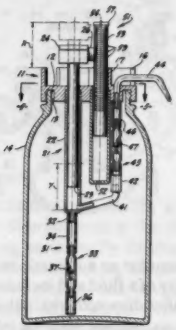
John J. Trujillo, 18837 Lamson Road, Castro Valley, Calif. 94546

Filed Nov. 7, 1975, Ser. No. 629,694
Int. Cl.[2] B67D *5/22*
U.S. Cl. 222—49 **6 Claims**

1. A liquid dispensing device comprising
a cap structure adapted to engage the open top of a liquid container and having a floor with a low upstanding wall thereabout and a slotted boss on said floor extending upwardly to a height not greater than that of said wall,
a pump including a hollow barrel depending from said floor and a plunger slidably disposed in said barrel in extension through said floor with an enlarged upper end disposed atop the floor of said cap structure,
an elongated gauge rod with markings along the length thereof depending from said cap structure and slidably disposed through the floor and boss thereof with a lateral projection atop said rod disposed to engage the enlarged upper end of said plunger, said gauge rod being movable upwardly from a depressed position with the lateral rod projection aligned with the top of said boss whereby the

upper end of said pump plunger and said gauge rod are movable upwardly of said wall during use and are otherwise disposable below the top of said wall to provide a substantially flat top to the cap structure,

locking means for adjustably positioning the top of said gauge rod a measured distance above said cap structure as indicated by said markings to establish the maximum movement of said pump plunger, and



valve means connecting the bottom of said pump barrel to the interior of said container and to distance means extending through said cap structure

whereby adjustable positioning of said gauge rod predetermines the volume of liquid dispensed by said container by each full stroke of said plunger.

4,057,175

SERVING CONTAINER FOR LIQUIDS OR POURABLE MATERIALS CONTAINED IN CARDBOARD PACKAGES

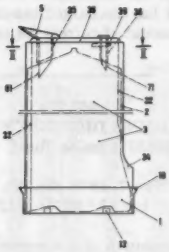
Hans Kessler, Dufourstrasse 48, Zurich, Switzerland (CH8008)

Filed Mar. 11, 1976, Ser. No. 665,802

Claims priority, application Switzerland, Mar. 13, 1975, 3183/75

Int. Cl.² B67B 7/24

U.S. Cl. 222—86 **7 Claims**



1. A serving container for flowable material in package of square edged shape, the container comparising a base portion and sleeve inserted into the base portion and fitted over the package, the sleeve having a lid provided with two tubes of different diameters having inclined tips extending into the interior of the sleeve and for extending into the package and serving as pouring and vent tubes, one of said sleeve and said base portion being provided with means for exerting pressure on the edges of the inserted package, said means for exerting pressure comprising the diagonal dimensions of said sleeve which an smaller than the diagonal dimensions of the package, and a outward curving of the sidewalls of the sleeve and the base portion.

4,057,176

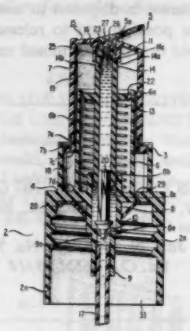
MANUALLY OPERATED SPRAY PUMP

William Horvath, Watchung, N.J., assignor to Plastic Research Products, Inc., Warren, N.J.

Continuation-in-part of Ser. No. 597,293, July 18, 1975, abandoned. This application May 5, 1976, Ser. No. 683,338

Int. Cl.² B05B 7/32

U.S. Cl. 222—193 **28 Claims**



1. A pressure actuated dispenser including a spray nozzle constructed in combination with the closure of a container of a reservoir of fluid product for dispensing said product in a carrier gas in the form of high pressure spray, said dispenser comprising in combination:

means including fixed and movable elements forming an annular variable volume carrier gas chamber constructed for compression and expansion in response to pressure and release from pressure on said dispenser;

a pump for said fluid product, said pump including a pump chamber and a hollow stem piston mechanically coupled for reciprocating action in synchronism with said movable elements of said variable volume chamber;

central valve means communicating between said product reservoir and said pump chamber;

means for maintaining said reservoir at substantially ambient pressure;

means for forming a mixing chamber surrounded by said annular gas chamber, said mixing chamber having an aperture communicating with said spray nozzle, and comprising a first inlet means including a normally closed flexible member of membraneous material for admitting said compressed carrier gas from said variable volume carrier gas chamber to said mixing chamber, and a second inlet means including a normally closed flexible member of membraneous material for admitting fluid product under pressure from said hollow stem piston to said mixing chamber;

a first means responsive to an initial compression stroke on said dispenser for simultaneously depressing said hollow stem piston to close said central valve means, compressing the carrier gas in said variable volume carrier gas chamber and deflecting the normally closed flexible member of said first inlet means to admit a blast of said compressed carrier gas into said central mixing chamber;

a second means responsive to a subsequent return stroke of said hollow piston stem upon release of pressure on said dispenser, to release said central valve means and to draw said fluid product into said pump chamber; and

said first means responsive to the subsequent compression strokes of said dispenser for simultaneously again depressing said hollow stem piston to close said central valve means while pumping said fluid product from said pump chamber up through said hollow stem piston again compressing the carrier gas in said variable volume carrier gas chamber, deflecting the flexible member of said first inlet means to admit a blast of said compressed carrier gas

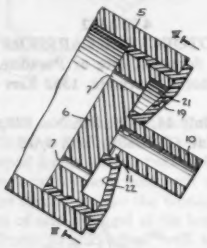
through said first inlet means and deflecting the flexible member of said second inlet means to admit said product through said second inlet means to admit said product through said second inlet means to mix in said mixing chamber to form an atomized spray of said product which is propelled out through said spray nozzle.

4,057,177

VALVED SQUEEZE BOTTLE FOR VISCOUS PRODUCTS

Robert H. Laauwe, 237 Green Ridge Road, Franklin Lakes, N.J. 07417

Filed Jan. 18, 1977, Ser. No. 760,384
Int. Cl.[2] B65D *25/52*; F16K *17/18*
U.S. Cl. 222—215 9 Claims



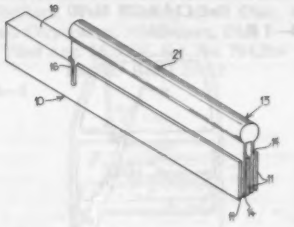
1. A squeeze bottle for containing and dispensing a viscous product and which is made of elastically deformable material so that after the bottle is squeezed and released from squeezing pressure, the bottle inherently springs back to its original unsqueezed shape, said bottle having a mouth provided with a dispensing valve comprising superimposed inner and outer parts normally closing said mouth, said inner part having at least one first product flow passage extending from its inside to its outside and a projection extending outwardly from its outside and the projection having a side in which at least one second product flow passage is formed, said second passage communicating with the outside of said valve and said outer part having a flexible diaphragm surrounding said projection and having a tubular neck slidably fitting the projection and normally covering and closing said second passage when the diaphragm is unflexed but uncovering and opening the second passage by sliding axially on the projection when the diaphragm is flexed outwardly, said parts forming a space between the outside of said inner part and the inside of said diaphragm into which when said bottle is squeezed a viscous product in the bottle can be squeezed via said first passage to apply pressure between the outside of the inner part and the inside of the diaphragm to cause the latter to flex outwardly and slide said tubular neck on said projection so as to uncover and open said second passage, said diaphragm being made of elastically deformable material and so that it inherently springs back to its original unflexed condition with said tubular neck covering and closing said second passage when the product in said space and bottle is released from squeeze pressure, one of said parts having an inwardly opening check valve for venting said bottle so that after release of squeeze pressure on the bottle air can replace product squeezed from the bottle and permit the latter to spring back to its unsqueezed shape and said diaphragm to spring back to its unflexed condition.

4,057,178

MATERIAL PLEATER

Edna Henderson Martin, 309 Oregon St., Birmingham, Ala. 35224

Filed Dec. 13, 1976, Ser. No. 750,133
Int. Cl.[2] A41H *43/00*
U.S. Cl. 223—35 3 Claims



1. A material pleater comprising:

a. an elongated member,

b. a plurality of parallel, longitudinally extending plate-like members carried by said elongated member with adjacent ones of said plate-like members spaced from each other to receive a pleat of said material therebetween,

c. an elongated pleat depresser having longitudinally extending spaced apart depresser elements with each said depresser element being disposed to move between adjacent ones of said plate-like members and depress a pleat of said material therebetween to form pleats between said plate-like members, and

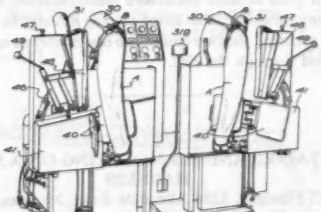
d. there being transversely aligned outwardly opening slots in said plate-like members which are in transverse alignment with and face transversely aligned outwardly opening slots in said depressor elements for receiving means for detachably connecting said pleats thus formed to each other so that upon movement of said plate-like members and said pleat depresser away from each other said pleats remain in the formed position.

4,057,179

GARMENT PRESSING MACHINES

Nicholas Wynne Everett, Carnforth, England, assignor to Ibis Engineers Limited, Kendal, England

Filed July 12, 1976, Ser. No. 704,759
Int. Cl.[2] A41H *5/00*
U.S. Cl. 223—73 5 Claims



1. A method of nipping and draping the armhole area of sleeves of jackets comprising the steps of: positioning the sleeve of a jacket on an elongated expansible sleeve form; bringing an expansible enlarged diameter internal pressing head into engagement with said form internally of the shoulder end of the sleeve whereby the seams between the jacket body and the adjacent sleeve which form the armhole area of the

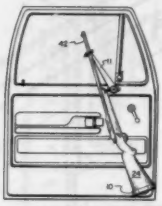
jacket are nipped or clamped between said form and said pressing head; and allowing said sleeve to set.

4,057,180

DOOR MOUNTED VEHICLE GUN RACK

Robert K. Whittaker, Rte. 2, Box 220, Kimberly, Idaho 83341

Filed Oct. 6, 1975, Ser. No. 619,609
Int. Cl.[2] A47B *81/00*
U.S. Cl. 224—1 R **1 Claim**



1. A two-piece gun rack for a vehicle door for holding mounted rifles, shotguns, and the like in an upright position adjacent said vehicle door comprising:

a gun butt rest adapted to be secured to a lower portion of an inside panel of a vehicle door such that it can be rotated about a substantially horizontal axis and fixedly secured in any rotatable position;

an elongated support arm having at one end thereof attaching means for securing the support arm to an upper portion of the inside panel of the vehicle door such that it can be rotated about a substantially horizontal axis and fixedly secured in any rotatable position and at the other end thereof barrel holding means comprising two legs in a generally right angle configuration, one leg consisting of an elongated extension member having a flat surface face containing an elongated slot, the other leg consisting of a pair of spaced apart, parallel arms, said parallel arms being turned at their outer ends away from the extension member, a curved surface face of said extension member for receiving a gun barrel therein extending between said elongated slot and said parallel arms;

elastic cord means having one end through and slidable along the slot in the said one leg and having an enlarged knob formed at the other end, whereby when said elastic means is positioned to extend between the parallel arms the enlarged knob having a diameter greater than the space between said parallel arms will engage the turned outer ends to hold the elastic means therein; and

fastening means slidable along the leg having the slot therein and securing the one end of the elastic means against being pulled through the slot.

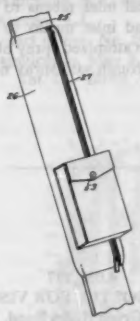
4,057,181

CONTAINER AND ITS MOUNTING ON A SAFETY HARNESS

Joseph C. Finnigan, 1204 Allendale Road, McLean, Va. 22101

Filed Oct. 30, 1975, Ser. No. 627,119
Int. Cl.[2] B60R *21/00*
U.S. Cl. 224—29 R **8 Claims**

1. In combination with a safety shoulder belt for the occupant of an automobile, a covering member embracing the belt adjacent the portion of the belt extending over the shoulder of the user and having an outer frontal surface away from the user, said member having resilient material embracing the belt to cushion pressure of the shoulder belt against the neck and shoulder of the user of the belt, means to detachably mount said covering member on said shoulder belt, an article container having clip means and means on the outer surface of said covering member to removably receive said clip means and



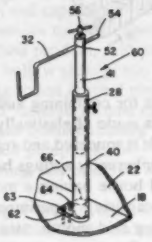
mount the container on the outer frontal surface of the covering member.

4,057,182

MOTORCYCLE CARRIERS

Lee R. Kolkhorst, deceased, late of Paradise, Calif., and by Virginia E. Kolkhorst, executrix, 1362 Kerr Lane, Paradise, Calif. 95969

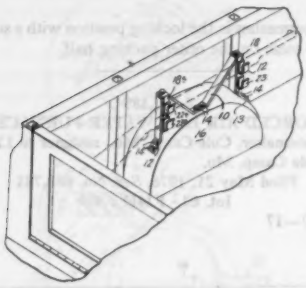
Filed July 14, 1975, Ser. No. 595,640
Int. Cl.[2] B60R *7/02, 9/10*
U.S. Cl. 224—42.45 R **1 Claim**



1. Apparatus for restricting the motion of a motorcycle carried by a pickup truck or similar vehicle which has a bed including a horizontal portion and at least one sidewall portion wherein the motorcycle is positioned with both wheels adjacent a sidewall and is provided with a rear-mounted hook-receiving member which is affixed to the motorcycle laterally off center, said apparatus comprising in combination, a mounting bracket affixed to said bed and including an upwardly directed stud portion, a substantially vertical hollow strut including mutually telescoping first and second members, said first telescoping member being removably mounted to said bed by slipping over said stud portion and the said second telescoping member being mounted relatively above said first telescoping member in overlapping telescoping relationship, means for fixing the vertical position of said second telescoping member relative to said first telescoping member, a transverse hook member slidably attached to the top of said second telescoping member adjacent and having an upwardly opening hook contour at the other end and means for adjusting the lateral position of said transverse hook member, so that the rear portion of the motorcycle can be lifted and the rearmounted hook receiving member thereof engaged with the hook contour of the transverse hook member to suspend the rear wheel of the motorcycle in a raised position relative to the horizontal portion of the vehicle bed so that the weight of the motorcycle causes the rear wheel to swing laterally toward and remain

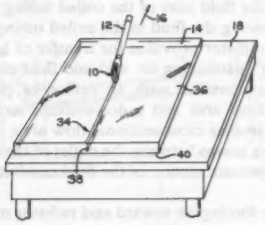
biased against the vertical strut, and the front wheel of the motorcycle can be turned against the sidewall and locked in position to restrict the motion of the motorcycle as it is being carried by the vehicle.

4,057,183
GUN RACK
Philip J. Ness, 5948 Mendocino Blvd., Sacramento, Calif. 95824
Filed Apr. 6, 1976, Ser. No. 674,117
Int. Cl.² B60R 9/00
U.S. Cl. 224—42.45 R **1 Claim**



1. A rack for guns or the like to be mounted on an upwardly extending curvilinear wheel well of a pickup truck bed comprising an M-shaped frame having two vertical legs curved at their ends to conform to the wheel well shape and a valley therebetween also conforming to the wheel well, means at the lower extremities of said legs and at the bottom of said valley to secure said frame to the wheel well within the vehicle, inverted L-shaped support elements secured at the top of each of said vertical legs to extend downwardly along the vertical legs, and at least one U-shaped clip secured to each said support element to support a gun or the like therebetween.

4,057,184
METHOD OF SCORING GLASS USING A SCORING WHEEL HAVING AN ARCUATE SCORING SURFACE
Edmund R. Michalik, West Mifflin, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Sept. 19, 1975, Ser. No. 615,149
Int. Cl.² C03B 33/02, 33/10
U.S. Cl. 225—2 **13 Claims**



1. In a method of scoring a refractory material selected from the group consisting of glasses, ceramics and glass-ceramics wherein the method includes the steps of contacting a surface of the refractory material with scoring means; providing relative movement between the scoring means and the piece of refractory material, while applying pressure to the scoring means to provide the refractory material with a score along a predetermined score path, the improvement comprising:

the imposing an indentation in the surface, the indentation during scoring has a substantially constant predetermined radius of curvature along its depth when viewed through an intersecting plane normal and transverse to the score path

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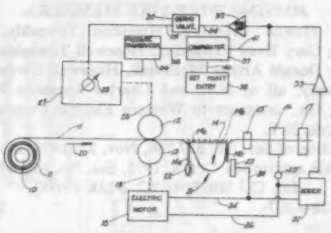
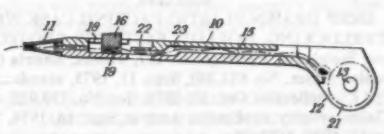
4,057,185
METHOD AND MEANS FOR OPERATING A PAIR OF PINCH ROLLS
Jerry L. Slama, Monroe; David J. Francis, Hamilton, and Gordon R. Shepherd, West Chester, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio
Filed Aug. 16, 1976, Ser. No. 714,316
Int. Cl.² B65H 23/22
U.S. Cl. 226—1 **10 Claims**



6. In an operation of the type utilizing first and second pinch rolls on a processing line for engaging therebetween a strip of material to facilitate the withdrawal of said strip from a supply thereof and to advance said strip along said line, the improved method of operating said pinch rolls comprising:

a. positioning said first pinch roll for engaging said strip and operating said first pinch roll at a preselected velocity so as to tend to advance said strip along said line;
b. positioning said second pinch roll to engage said strip and operating said second pinch roll at a preselected value of torque;
c. monitoring the actual torque developed by said second pinch roll;
d. developing an error signal representing the difference between said actual torque developed and said preselected torque value; and
e. adjusting said actual torque developed to minimize the magnitude of said error signal.

4,057,186
WIRING PENS
Denyer Edward Hedger, Southampton, England, assignor to Vero Electronics Limited, Eastleigh, England
Filed Oct. 21, 1976, Ser. No. 734,506
Int. Cl.² B65H 17/34
U.S. Cl. 226—127 **12 Claims**



1. A wiring pen for use in connecting electrical components on a circuit board with electrically conductive wire and comprising:

an elongated pen-shaped body having a bore longitudinally extending along the entire length of said body and a slot with said bore passing through said slot;
means for holding a supply of electrically conductive wire at one end of the body;
a tip at the other end of the body from which wire emerges after passing from the supply through said bore;

a slider slideably arranged within said slot;

a tongue spaced from said slider to define therebetween a path for the wire which when open allows free passage of the wire along the bore during the connection of electrical components with the wire;

a connecting member between said tongue and said slider, said connecting member tending to maintain said tongue and said slider spaced apart to define said path but permitting said tongue and said slider to be manually moved together to grip a wire passing along said path; and,

said slider being slideable along said slot for moving a gripped wire along said bore towards said tip of said body.

4,057,187

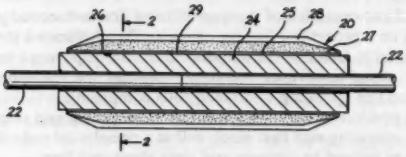
JOINING WIRE-LIKE MEMBERS

Benjamin Howell Cranston, Hamilton Township, Mercer County; Gary Evan Kleinedler, Hopewell Township, Mercer County; Donald Arthur Machusak, Hopewell Borough, Mercer County, all of N.J., and Charles Augustus Wiechard, Tucker, Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation of Ser. No. 527,786, Nov. 27, 1974, abandoned. This application Oct. 8, 1975, Ser. No. 620,609

Int. Cl.[2] H02R *43/02*; B23K *19/00*

U.S. Cl. 228—107 **12 Claims**



1. A method of joining first and second wire-like metallic members, comprising:

coating a substantial portion of the exterior surface of a hollow metallic member with a primary explosive composition;

juxtaposing the end portions of the first and the second members in approximate coaxial alignment within said hollow metallic member; and

detonating said primary explosive composition to propel and impact said hollow member against said aligned first and second members at a velocity of impact sufficient to spurt a jet of material, comprising at least one member surface, between said impacted hollow member and said impacted first and second members, respectively, to form metallurgical bonds therewith to indirectly join said aligned first and second members.

4,057,188

DEEP DRAWN PLASTIC PACKING CASE WITH INTERLOCKING, HOLLOW FASTENER PROJECTIONS

Dieter Steinhardt, Penzingerstr. 117, Vienna, Austria (1140)

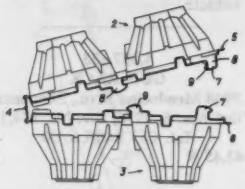
Division of Ser. No. 612,240, Sept. 11, 1975, abandoned. This application Oct. 19, 1976, Ser. No. 733,922

Claims priority, application Austria, Sept. 16, 1974, 7478/74; May 13, 1975, 3657/75

Int. Cl.[2] B65D *1/26*

U.S. Cl. 229—29 M **5 Claims**

1. A packing case produced of deep drawn plastic sheet material, comprising two halves joined by a web and provided with recesses for receiving appropriate goods, at least the edges of the two packing halves coming into contact one over the other during the locking of the packing case having hollow projections which are integral with the packing halves and intermeshing by pairs to constitute a locking part, the improvement consisting in that the hollow projections are hook shaped and a hollow stem projecting from the one packing half changes into a hollow nose projecting vertically from said



stem and intermeshes in the locking position with a similar nose of a hollow stem on the other packing half.

4,057,189

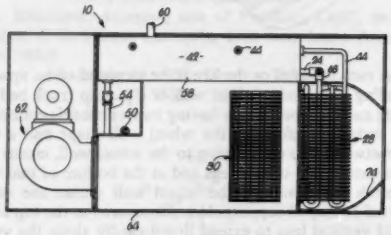
FORCED AIR HOT WATER FURNACE

Lloyd L. Shoemaker, Cole Camp, Mo., assignor to Lloyd's Furnaces, Cole Camp, Mo.

Filed May 21, 1976, Ser. No. 688,741

Int. Cl.[2] F24H *3/06*

U.S. Cl. 237—17 **1 Claim**



1. A forced air hot water furnace comprising:

a reservoir provided with a supply of fluid, said reservoir having an inlet port for ingress of said fluid and an outlet port for egress of said fluid;

pump means provided with inlet and outlet ports, the inlet port of the pump being in communication with the outlet port of the reservoir;

coiled tubing having a series of interconnected, U-shaped stretches, said stretches lying in multiple, nonparallel planes, the coiled tubing having a fluid inlet and a fluid outlet, the outlet port of the pump being in communication with the fluid inlet of the coiled tubing;

means for heating the fluid in the coiled tubing;

at least one radiator provided for transfer of heat in a fluid conduit to surrounding air, said said fluid conduit having an upstream section with an orifice of predetermined cross-sectional area and a downstream section with an orifice of smaller cross-sectional flow area;

fluid coupling means between the outlet of the coiled tubing and the upstream section of the fluid conduit of the radiator; and

a blower for forcing air toward said radiator means so as to pass the upstream radiator section first.

4,057,190

FUEL BREAK-UP DISC FOR INJECTION VALVE

Alexander Michael Kiwior, Warren, and James Daniel Bode, Royal Oak, both of Mich., assignors to Bendix Corporation, Southfield, Mich.

Filed June 17, 1976, Ser. No. 696,999

Int. Cl.[2] B05B *1/30*

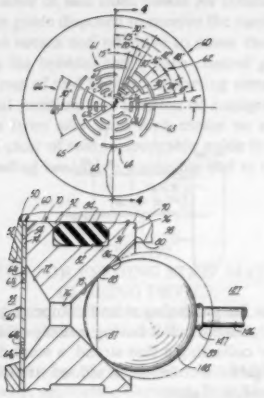
U.S. Cl. 239—558 **3 Claims**

1. In a fuel injection valve adapted to be mounted on an

internal combustion engine so to be communicated with an intake passage of a combustion chamber thereof comprising:

fuel outlet means adapted to be communicated with said intake passage and comprising a fuel metering member and a fuel breakup member;

said fuel metering member comprising a converging inlet surface, a diverging outlet surface, and a metering orifice intermediate said inlet surface and said outlet surface, said metering orifice having a total orifice flow area thereacross for effecting a predetermined flow rate of fuel therethrough; and said fuel breakup member comprising a



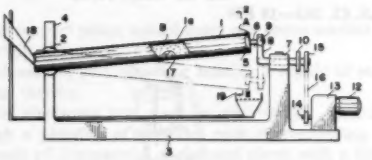
thin disk having an axial thickness not substantially greater than 0.05 mm secured across said diverging outlet surface and comprising a plurality of narrow slots therethrough for breaking said fuel up into uniformly small droplets, said slots having a total slot area thereacross establishing a minimum orifice-to-slot area ratio with said total orifice area of not less than 1.5, said orifice-to-slot area ratio and said 0.05 mm axial thickness of said thin disk cooperating to permit said orifice area to determine substantially the entire magnitude of said predetermined flow rate.

4,057,191

GRINDING METHOD

Ietatsu Ohno, 1-2, 1-chome Kasuya, Setagaya, Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 717,010
Int. Cl.² B02C *17/14*
U.S. Cl. 241—30 **2 Claims**



1. The grinding method comprising in combination the steps of:

a. confining a longitudinal hollow tank at one end in a fixed universal joint for limited rotational movement, said hollow tank having an internal surface lining,

b. feeding materials to be ground with a grinding agent in said first end of the tank,

c. grinding said materials by moving the opposite end of said tank in an arcuate path without rotating the tank, whereby the materials are ground by engaging the grinding agent and circling the inner peripheral lining of the tank as they flow from said one end to said opposite end of the tank, and

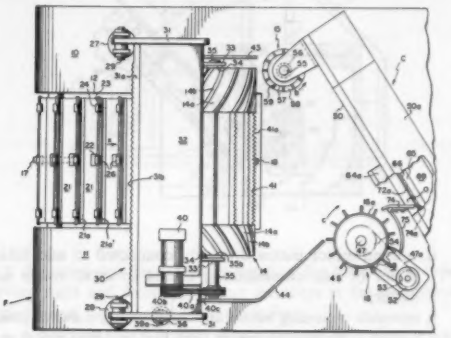
d. extracting materials and grinding agent from the said opposite end of the tank.

4,057,192

TREE HARVESTING MACHINE

Leward N. Smith, Remus, Mich., assignor to Morbark Industries, Inc., Winn, Mich.

Filed June 2, 1975, Ser. No. 582,429
Int. Cl.² B02C *18/08*
U.S. Cl. 241—92 **8 Claims**



1. In a machinery for reducing forest products to wood chips:

a chipper disc assembly having a front face and a rear face and at least one opening therein leading from the rear face to the front face;

means for rotating said disc assembly in the direction of rotation at a chip cutting speed;

a feed mechanism for moving the said products to the rear face of said disc assembly comprising: a longitudinally disposed live feed bed to which said disc assembly is angularly disposed; a top roll crosswisely disposed to the live feed bed and vertically movable to crush limbs down to the trunk of a tree being fed toward the rear face of the chipper disc assembly; generally vertically disposed side guides having tree engaging surfaces thereon disposed downstream of said roll; at least one of said side guides comprising roll with vane means thereon for revolving a forked tree partly about its axis; and means for revolving said rolls and live bed at coordinated tree feeding speeds in directions of rotation to move a tree toward the chipper disc assembly;

a disc assembly housing including a rear wall with an opening to admit said products, a front wall, and a perimetral wall with an opening to egress chips; and

disc knife blade means for said opening positioned to cut said products with rotation of said disc assembly into chips and propel them through said opening forwardly.

4,057,193

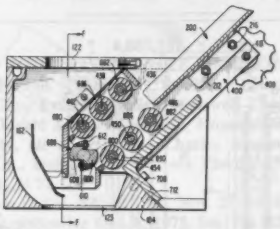
APPARATUS FOR INTRODUCING CONTROLLED AMOUNTS OF PIGMENT INTO THERMOMECHANICALLY FORMED PLASTIC ARTICLES

William B. Bradbury, Brielle, N.J.; Robert H. Watts, Cincinnati, and E. Timm Scott, Norwalk, both of Ohio, assignors to PMS Consolidated, Somerset, N.J.

Filed Jan. 21, 1976, Ser. No. 650,938
Int. Cl.² B02C *18/44*
U.S. Cl. 241—281 **5 Claims**

1. An apparatus for comminuting a pigment bar to add color to a supply of plastic material prior to the molding of the plastic material, comprising:

a. comminuting means having a rotary cutter with radially protruding discontinuous, cutting elements to comminute said pigment bars, said comminuting means having an inlet for said plastic material, and an outlet for said plastic material and said comminuted pigment;
b. feeding means attached to said comminuting means to feed said pigment bars into said comminuting means, said feeding means having a plurality of driven rollers bearing against said pigment bars;
c. first motor means drivingly connected to said driven rollers in said feeding means by interengaging gears;



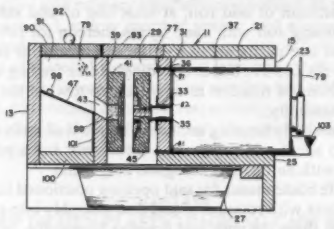
d. second motor means drivingly connected to said rotary cutter of said comminuting means so as to rotate said cutter;
e. movable mounting means attaching said first motor means to said comminuting means such that said first motor may be moved out of driving connection with said driven rollers, and by disengaging said interengaging gears; and
f. manual rotating means conected to said driven rollers such that said rollers may be rotated manually when said first motor is out of driving connection therewith.

4,057,194

PORTABLE FLOUR MILL

Roger W. Orton, 2274 W. La Loma Drive, Rancho Cordova, Calif. 95670

Filed Aug. 23, 1976, Ser. No. 716,754
Int. Cl.[2] B02C *7/13, 7/14*
U.S. Cl. 241—248 **10 Claims**



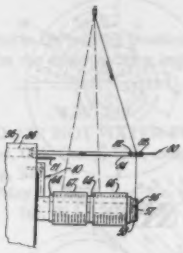
1. In a flour grinding mill, the combination of an up-standing box-like housing having an opening in the top portion thereof, a removable interior wall, a fixed interior wall, grinding wheels laterally disposed in said housing and spaced apart in said housing with respect to each other, one of said grinding wheels being fixed to the removable interior wall, the other said grinding wheel being journaled for rotation in the fixed interior wall opposite said fixedly mounted grinding wheel, driving means operable to rotatably drive said grinding wheel journaled for rotation in the fixed interior wall, an entrance-way in the removable interior wall, a feed hopper inside the housing an exitway coincident with said entrance-way of said fixedly mounted grinding wheel, one of said grinding wheels comprising a substantially cylindrical body portion having a grinding face including at least one radially extending "v" shaped groove.

4,057,195

APPARATUS FOR PACKAGING STRAND

Bernard H. Jones; Daniel Cox, and Don R. Gallagher, all of Anderson, S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 7, 1976, Ser. No. 674,478
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—18 G **10 Claims**



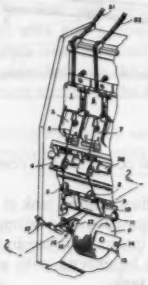
1. Apparatus for packaging strand comprising:
a. a driven rotatable collet having a first package collection region for collecting a first strand, a second package collection region for collecting a second strand and a temporary collection region;
b. a strand engaging member having a recess, a first guide surface and a second guide surface, the first guide surface and the second guide surface being on opposite sides of the member; and
c. means for moving the member along a path to move the first strand and the second strand from the package collection regions to the temporary collection region, the first guide surface being adapted to contact and guide the first strand toward the recess and the second guide surface being adapted to contact the second strand as the member is moved to move the strands to the temporary collection region.

4,057,196

APPARATUS AND METHOD FOR WINDING YARN ON A BOBBIN

James W. Amos, Siluria, Ala., assignor to Canton Textile Mills, Inc., Canton, Ga.

Filed Jan. 3, 1977, Ser. No. 756,487
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—18 PW **7 Claims**



1. Apparatus for winding yarn on an empty bobbin so as to form a reserve winding having an accessible end at one end of

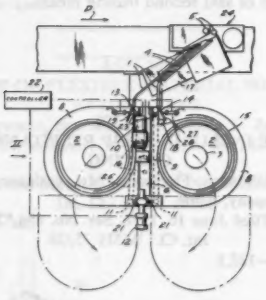
the bobbin, said apparatus comprising yarn feed means for continuously feeding a running yarn, yarn collecting means for receiving and collecting a running yarn fed by said yarn feed means, a pair of pivotally mounted spaced apart bobbin supporting arms each having a bobbin supporting flanged roller rotatably mounted thereon for respectively engaging the ends of a bobbin having axially extending angularly spaced slots formed in one end thereof and extending inwardly by a distance farther than the distance by which the associated roller projects into the bobbin so that yarn from said yarn feed means may pass inwardly through one of said slots and outwardly through the other of said slots, means for rotating the bobbin, a reciprocable guide disposed to receive the running yarn from said yarn feed means and effective to cause the yarn to wind evenly along the bobbin, and a yarn control guide movably mounted on one of said bobbin supporting arms and movable from a normal position to a position of engagement with the running yarn from said yarn feed means so as to hold the running yarn clear of said reciprocable guide in order to form a reserve winding having an accessible end at one end of the bobbin.

4,057,197

APPARATUS FOR FEEDING STRIP MATERIAL TO GLUEING DEVICE

Manfred Rottmann, Hiddenhausen, Germany, assignor to F. Meyer & Schwabedissen GmbH & Co. KG., Herford, Germany

Filed May 25, 1976, Ser. No. 691,554
Claims priority, application Germany, June 12, 1975, 2526158
Int. Cl.² B65H *19/04*
U.S. Cl. 242—58 **11 Claims**



1. A feed apparatus for strip material, said apparatus comprising:

a stack of support plates spaced apart one above another in an upright direction;

means on each of said plates for holding a supply of strip material therein;

means for displacing said stack in said upright direction through a plurality of positions each corresponding to alignment of a respective one of said plates with a fixed take-off guide;

a fixed roller on each of said plates;

a displaceable roller on each of said plates movable toward and away from the respective fixed roller;

means on each of said plates for moving the respective displaceble roller toward the respective fixed roller for pinching the strip material from the respective supply;

means for rotating one of said rollers on each plate and thereby pulling the material off the respective supply when same is pinched between the respective rollers; and

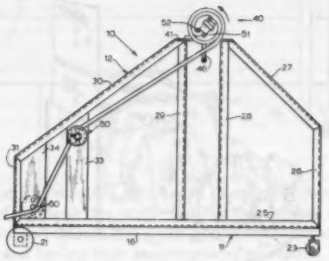
means for displacing each of said plates out of said stack in a transverse direction transverse to the upright direction.

4,057,198

FIRE HOSE WINDING APPARATUS

Bert Dean Whitfield, Murdock Staff House, Butner, N.C. 27509

Filed Aug. 25, 1976, Ser. No. 717,629
Int. Cl.² B65H *75/40*
U.S. Cl. 242—86.2 **1 Claim**



1. An apparatus for manually winding fire hose of the type having male and female coupling members at the respective ends thereof, comprising in combination:

a. a horizontal rectangular base structure mounting wheel means proximate the forward and rearward corners thereof for supporting the apparatus and including wheels pivotal on a vertical axis at each of the corners at the rearward end of said base structure;

b. vertical support structure means fixedly secured to and extending upwardly from said horizontal base;

c. hand-operated reel means mounted on the upper portion of said vertical support means and comprising:

i. a horizontal drive shaft journaled for rotation about a horizontal axis transverse to the longitudinal axis of the apparatus;

ii. handle means at a first end of said shaft for driving such shaft; and

iii. enlarged disc means at the second end of said shaft mounting a pair of pin projections oppositely spaced equal distances from the rotational center of said disc;

d. first idler roller means projecting from said vertical support structure means and being longitudinally aligned with said pin projections substantially along the longitudinal gravitational center of said apparatus, said first idler roller means positioned at a lower forward end of said apparatus immediately above said base structures and immediately behind the wheel means located at such forward end; and

e. second idler roller means projecting from said vertical support structure means and being longitudinally aligned with said pin projections and first idler roller means and being positioned therebetween at a position higher than and rearwardly of said first idler roller means and lower than said pin projections, said second idler roller means being adjustable to different widths of flattened hose and including a fixed post member mounted on said vertical support structure means, a roller sleeve adapted for rotation about said post and a guide disc adjustably mounted at the outward end of said post member for engaging an edge portion of the flattened hose

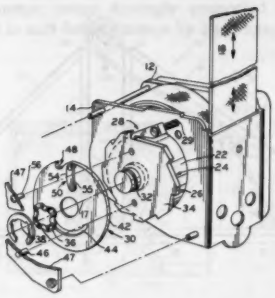
whereby a fire hose length may be wound upon said apparatus with the hose routed under the bottom roller surface of said first idler roller means, over the top roller surface of said second idler roller means and onto the pin projections of said reel means.

4,057,199

TENSIONLESS RETRACTOR

Harold R. Scibbe, Chardon, and Edward J. Smith, Mentor, both of Ohio, assignors to REPA Feinstanzwerk GmbH, Industriegebiet, Germany

Filed Mar. 1, 1976, Ser. No. 662,555
Int. Cl.[2] A67B *35/00*; B65H *75/48*
U.S. Cl. 242—107.7 15 Claims



9. Apparatus comprising an axially extending reel supported for rotation about a central axis thereof, means on said reel for connecting an automotive seat belt thereto in a manner such that the belt is wound or unwound from the reel as the reel is rotated about its central axis, means for biasing said reel in a first direction tending to wind the belt about the reel, locking surface means fixedly connected to the reel, a locking member biased for movement toward a position in which it engages the locking surface means and resists rotation of said reel in said first direction, a control member positionable in the path of movement of a portion of said locking member and movable relative to the locking member, said control member comprising a first portion engageable with said locking member to hold the locking member out of engagement with said locking surface means and a second portion for allowing said locking member to move into engagement with said locking surface means, gate means mounted on said control member and movable relative thereto to a first position holding said locking member from movement into engagement with said locking surface means during a preselected range of movement of said control member relative to said locking member, said gate means being movable to a second position allowing the second portion of the control member to cooperate with the locking member to move into engagement with said locking surface means during a preselected sequence of movements of said control member relative to said locking member.

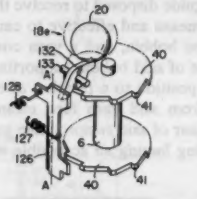
4,057,200

EMERGENCY LOCKING RETRACTOR FOR VEHICLE SEAT BELTS

Susumu Ubukata; Shozo Iyoda, and Kenji Oda, all of Nagoya, Japan, assignors to Susumu Ubukata, Nagoya, Japan

Division of Ser. No. 562,336, March 26, 1975, abandoned. This application July 9, 1976, Ser. No. 704,104
Claims priority, application Japan, June 1, 1974, 49-62147; July 15, 1974, 49-81487; Sept. 26, 1974, 49-111211
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A 6 Claims

1. An emergency locking retractor for a seat belt of a vehicle comprising, in combination: a frame adapted to be secured to the vehicle; a drum rotatably supported by said frame and having one end of the belt anchored thereto for winding and unwinding the same, said drum having an axis of rotation oriented at an angle other than zero relative to the horizontal; first biasing means for causing said drum to rotate in the belt winding direction; a locking wheel rotatable in unison with said drum; detent means pivotable about an axis parallel to the axis of drum rotation between an operative position where said detent means engages said locking wheel to lock said drum against rotation in the belt unwinding direction, and an inoperative position where said detent means is disengaged from said locking wheel; second biasing means for biasing said detent means from the inoperative toward the operative position; acceleration sensing means including an inertial element normally held in a predetermined position so as to be displaceable relative to said frame in response to acceleration of the vehicle; and actuator means interposed between said sensing means and said detent means and having a first end disposed under said inertial element to be urged downwardly thereby, and a second



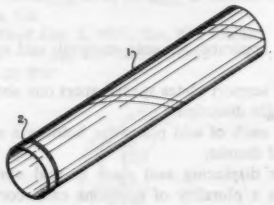
end disposed for abutting contact with said detent means to hold the latter in the inoperative position against the bias of said second biasing means; said actuator means including a mechanism for converting upward displacement of said first end in response to displacement of said inertial element into a displacement of said second end in a direction which is substantially the direction from the inoperative toward the operative position of said detent means and which is different from that of the displacement of said first end, whereby upon displacement of said first end, said second end permits said detent means to move from the inoperative to the operative position under the bias of said second biasing means.

4,057,201

YARN CORE INCLUDING SLIP RESISTANT TRANSFER COATING

Robert M. Wilkinson, Florissant, Mo., assignor to Alton Box Board Company, Alton, Ill.

Filed June 16, 1976, Ser. No. 696,574
Int. Cl.[2] B65H *75/28*
U.S. Cl. 242—125.1 3 Claims



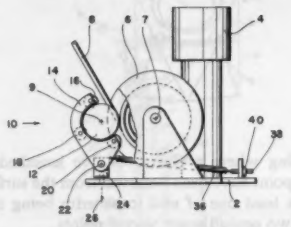
1. A yarn core having a transfer coating comprising, a length of cylinder like member, said member having a smooth outer covering to assist in yarn winding and transfer, a frictional transfer ring provided proximate one end of the core and formed of a slip resistant coating material to facilitate the engagement of yarn, said transfer ring including a shallow cavity formed in the cylindrical like member at the vicinity of the said ring, and including the slip resistant coating material applied therein, said slip resistant coating material comprising a composition of a colloidal silica that enhances the coefficient of friction of the transfer ring and effectively temporarily adheres the yarn as it is being wound with respect to the core.

4,057,202

WINCH CABLE ROLLER ASSEMBLY

Harold F. Carr, Jr., Hixson, Tenn., assignor to Ernest Holmes Division, Dover Corporation, Chattanooga, Tenn.

Filed Sept. 2, 1976, Ser. No. 719,900
Int. Cl.² B65H 57/00
U.S. Cl. 242—157 R 12 Claims



1. A cable engaging apparatus for a drum having cable spooled thereon, comprising:

a roller means comprised of a pluality of resilient discs mounted coaxially;

means for mounting said roller means with its axis approximately parallel to the axis of said drum; and

forcing means connected to said mounting means for urging the circumferential surface of said discs towards the drum and into resilient engagement with said cable spooled on said drum, said discs thereby applying an axially directed guide force thereto;

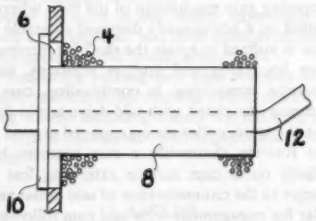
whereby as each wrap of said cable is spooled on said drum, it is forced into an axially adjacent position with the preceding wrap.

4,057,203

PACKAGE OF FLEXIBLE MATERIAL WITH OVAL PAYOUT TUBE

James W. Newman, Scarsdale, and Ronald E. Zajac, Yonkers, both of N.Y., assignors to Windings, Inc., Goldens Bridge, N.Y.

Filed May 14, 1976, Ser. No. 686,569
Int. Cl.² B65H 55/02
U.S. Cl. 242—163 2 Claims



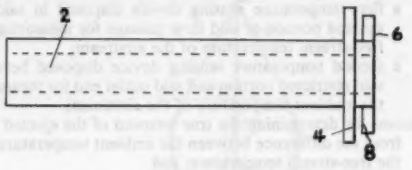
1. A package comprising a coil of flexible material wound in a plurality of layers of Figure-8 winds with the cross-overs progressing around the package in each layer and having a radial opening through the wall of the coil from the outside to a central core space of the wound flexible material, said radial opening having a greater length in the direction substantially perpendicular to the axis about which said material was wound, and a payout tube passing through said radial opening through which the inner end of the material is drawn out, said payout tube being oval in cross-section with its major axis extending parallelly to said perpendicular direction, the cross-section of the material being less than the minor axis of said payout tube.

4,057,204

TUBE FOR INNER END FEEDOUT OF FLEXIBLE MATERIAL AND PACKAGE UTILIZING THE SAME

Ronald E. Zajac, Yonkers, N.Y., assignor to Windings, Inc., Goldens Bridge, N.Y.

Filed May 19, 1976, Ser. No. 688,023
Int. Cl.² B65H 55/02, 57/12
U.S. Cl. 242—163 3 Claims



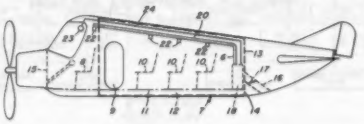
1. A tube for insertion into a coil of material wound in a plurality of figure-8s for inner end feedout having a flange adjacent one end thereof and a pair of projections spaced from the flange and having their inner surfaces tapered.

4,057,205

AIRCRAFT WITH OXYGEN SUPPLY AND METHOD OF SUPPLYING OXYGEN THERETO

Richard R. Vensel, 53 Academy Ave., Pittsburgh, Pa. 15228

Filed Aug. 13, 1976, Ser. No. 714,113
Int. Cl.² B64D 13/06
U.S. Cl. 244—118 P 12 Claims



1. The combination, with an airplane having an unpressurized cabin such that the pressure within the cabin corresponds to the pressure of the atmosphere surrounding the plane at any altitude at which the airplane is flying, of means in the cabin of the plane for monitoring the oxygen content of the atmosphere within the cabin, a source of oxygen supply aboard the airplane, and means responsive only to said monitoring means for releasing oxygen from the supply source into the cabin when the oxygen content for any cause falls below a predetermined partial pressure and terminating the release of oxygen from said source when said partial pressure of oxygen is restored.

4,057,206

EJECTION SEQUENCING SYSTEM WITH AIRSPEED AND ALTITUDE SENSING

James W. Duncan, Arden, and Walter R. Peck, Asheville, both of N.C., assignors to Stencel Aero Engineering Corporation, Asheville, N.C.

Continuation of Ser. No. 587,277, June 16, 1975, abandoned. This application June 8, 1976, Ser. No. 693,843
Int. Cl.² B64D 17/62
U.S. Cl. 244—147 6 Claims

1. An ejection sequencing system for controlling the deployment of a recovery parachute from its container, said recovery parachute being connected to an ejected load, said system comprising:

first means for continuously sensing pressure altitude and for generating a first signal when the pressure altitude of the ejected load is less than a predetermined maximum amount;

second means for continuously sensing the true airspeed of the ejected load in the airstream and for generating a

second signal when the ejected load true airspeed is less than a predetermined maximum amount; and

means responsive to said first and second signals for initiating deployment of the recovery parachute from its container;

said second means including an airstream probe having

an air inlet end, an air outlet end and a flow passage extending therebetween, said flow passage having a restricted portion therein;

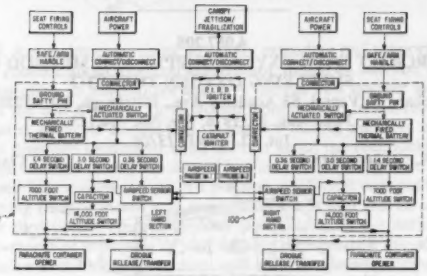
a first temperature sensing device disposed in said restricted portion of said flow passage for measuring the free-stream temperature of the airstream;

a second temperature sensing device disposed between said restricted portion and said outlet end for measuring the ambient temperature of the airstream;

means for determining the true airspeed of the ejected load from the difference between the ambient temperature and the free-stream temperature; and

an interior housing for said second temperature sensing device disposed within said flow passage between said restricted portion and said outlet end, said interior housing being connected to said probe by vanes.

4. An airspeed sensing system comprising



probe means positionable in the airstream, said probe means having an air inlet end, an air inlet end and a flow passage extending therebetween, said flow passage having a restricted portion therein; and

temperature sensing means for measuring the free-stream static and total temperatures, said temperature sensing means including computing means for solving the formula:

$$V = 109.5 \sqrt{T_t - T}$$

where V is the true airspeed, T_t is the free-stream temperature and T is the ambient temperature, said temperature sensing means comprising

a first temperature sensing device disposed within said restricted portion of said flow passage for measuring the free-stream temperature of the airstream;

a second temperature sensing device disposed between said restricted portion and said outlet end for measuring the ambient temperature within said probe; and

an interior housing for said second temperature sensing device disposed within said flow passage between said restricted portion and said outlet end, said interior housing being connected to said probe by vanes.

4,057,207

SPACE VEHICLE MODULE

John Paul Hogan, 600 Elm St., Williamsburg, Iowa 52361

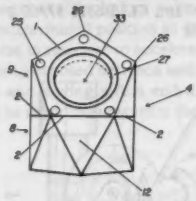
Filed Apr. 8, 1976, Ser. No. 674,884

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.[2] B64G *1/00*; E04B *1/348*

U.S. Cl. 244—159 **22 Claims**

1. A space station structure designed as a vehicle through which artificial gravity and a pressure tight terrestrial environment can be provided occupants of the structure, comprised of a plurality of generally cylindrical individual modules, each module following the geometry of at least two truncated icosahedra that are joined along their truncation surfaces, the truncations occurring where a cluster of five icosahedral faces about a vertex point have been removed from the surface of an icosahedron; at least one of said icosahedra being truncated about at least two non-adjacent vertex points.



4,057,208

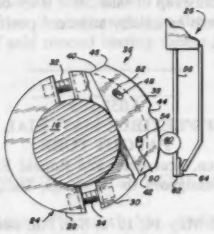
SLIDE CAM ASSEMBLY FOR RAILROAD-CROSSING GATE MECHANISM

Frank Andrews, Chicago, and Richard W. McKee, Lake Bluff, both of Ill., assignors to Federal Signal Corporation, Oak Brook, Ill.

Filed Feb. 18, 1976, Ser. No. 659,100

Int. Cl.[2] B61L *29/04, 29/08*

U.S. Cl. 246—125 **4 Claims**



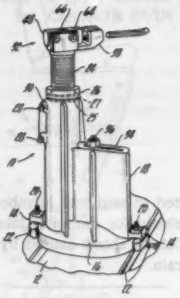
1. Motor control apparatus for controlling a drive motor of a railroad crossing gate mechanism of the type wherein a gate arm is mounted on a horizontally disposed rotatable shaft and a drive motor is utilized to rotate the shaft for moving the gate arm between horizontal and upright positions, said motor control apparatus comprising, in combination, cam follower and switch means associated with said drive motor for starting and stopping the same; collar means engaged around said shaft for conjoint rotation therewith; a cam segment having an arcuate radially outer cam surface extending less than 180 degrees relative to the circumference of said collar and carried on said collar for engagement with said cam follower to close said switch means, said cam segment being mounted on said collar so as to be circumferentially slidable thereon a limited distance relative to said collar; said collar, cam segment and cam follower means being relatively positioned so that said cam segment moves downwardly relative to said cam follower during raising of said gate arm, and as the gate arm reaches its upright position said outer cam surface disengages from said cam follower permitting said switch to open; and said cam segment being located generally to one side of said shaft at the point of disengagement, whereby gravity will assist said cam follower in displacing said cam segment downwardly to its lowermost position relative to said collar, thereby creating a predetermined gap between said cam segment and said cam follower in the upright position of said gate arm.

4,057,209

LATERAL ADJUSTMENT MECHANISM FOR A MACHINE ANCHOR

Scott L. Holman, Farmington Hills, Mich., assignor to Bay City Foundry Company, Franklin, Mich.

Filed Dec. 6, 1976, Ser. No. 747,829
Int. Cl.[2] A47G 19/00
U.S. Cl. 248—13 11 Claims



1. An anchoring arrangement having a lateral adjustment capability for supporting a structure with respect to a base surface comprising:

an anchor housing adapted to be secured to said base surface;

a vertically extending shaft received within said anchor housing;

means for adjusting the elevational position of said vertically extending shaft;

lateral adjustment means carried by the upper end of said vertically extending shaft; said adjustment means including an at least partially cylindrical slide member, such slide member having mounted means for securing said supported structure thereto;

means supporting said slide member for lateral movement along an axis parallel to the surface of said base structure, said means including a body member having a socket formed therein and adapted to slidably receive said slide member for movement therein, said body member being formed with a slot extending into said socket along the length thereof to form opposed socket walls, said slide member disposed in said socket with said mounting means accessible through said slot;

drive means included in said lateral adjustment means and adapted to reciprocate said slide member in said socket to thereby produce said lateral adjustment;

locking means for locking said slide member in any given adjusted position along said line of lateral movement, said locking means including means for drawing said socket walls formed by said slot into engagement with said slide member.

4,057,210

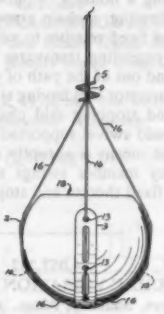
ARTICLE HOLDING DOUBLE-SLING KIT

Lester R. Wellman, 110 Lakewood Place, Highland Park, Ill. 60035

Filed July 28, 1976, Ser. No. 709,381
Int. Cl.[2] F16M 13/00
U.S. Cl. 248—318 6 Claims

1. An article-holding kit which comprises:

a. a first pair of elongated strips, each of which contains (i) a plurality of apertures along its length and, (ii) elongated slots intermediate said apertures and in alignment therewith, a first one of said strips having at least two parallel slots proximate to the center thereof, said slots adapted to receive, in crossed configuration, the second of said strips which contains at least two off-sets on each edge (i) proximate to the center thereof and, (ii) which abut the edges off said first strip when the strips are interlaced in latched, cross configuration; and,



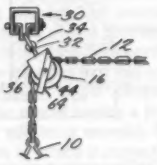
b. a second pair of shorter, elongated strips, each of which contains a plurality of apertures along its length, and one of which is foldable upon itself, whereby the apertures therein are aligned.

4,057,211

SAFETY SYSTEM FOR OVERHEAD SUPPORT OF WEIGHTED ARTICLES

Junius Thomas Moore, Charleston, W. Va., assignor to The Moore Company, Inc., Charleston, W. Va.

Filed Feb. 13, 1976, Ser. No. 658,051
Int. Cl.[2] B42F 13/00
U.S. Cl. 248—332 14 Claims



1. In a system for raising and lowering a weighted article between supported elevated and supported lower positions, the combination comprising:

an overhead support means;

a pair of pulley members supported from said support means at laterally spaced points from each other;

means to swivel support one of said pulley members from said overhead support means;

a fixed attachment means supported within reach of a person;

a link chain connected at one end to the article and passing vertically upwardly over the swivel supported pulley member and then the other pulley member and extending downwardly and connected at its other end to said attachment means said chain having a length when fully extended sufficient to permit said article to be suspended within reach of a person;

means on said chain positioned a sufficient distance from the end of the chain connected to said attachment means for connecting the chain to said attachment means when the chain is drawn downwardly to raise the article to the elevated position;

said means to swivel support one of the said pulley members permitting said one of said pulley members to swivel at an angle to a vertical through its point of support to said support means during normal operation of raising, lower-

ing and supporting the article in elevated and lower positions;

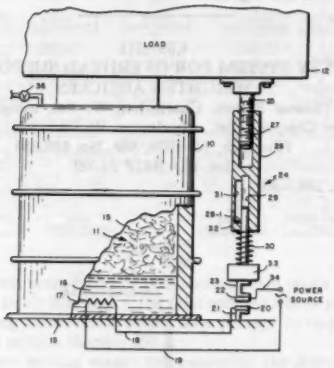
The improvement comprising said swivel supported pulley member including a housing, a pulley sheave rotatably supported in said housing, a chain arrestor arm projecting from said housing and fixed relative to said housing and having at least a portion extending transverse of and spaced from the pulley sheave and out of the path of said chain during normal operation, said arrestor arm having stop means on said portion for engaging and stopping said chain when tension in said chain between said swivel supported pulley member and said fixed attachment means is abruptly reduced and said swivel supported pulley member swings toward the vertical and moves the arm fixed thereto and stop means into engagement with the chain.

4,057,212

FLUIDIC VIBRATION ISOLATOR

Dale W. Schubert, Sudbury, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

Filed Aug. 15, 1975, Ser. No. 604,908
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—358 R **3 Claims**



1. A vibration isolator system comprising a vibration isolator having a closed chamber, a liquid in said chamber, a vapor of said liquid in said chamber, heating means positioned in said chamber for heating said liquid and sensing means for sensing the relative height of said isolator to control the temperature of said liquid in said chamber, said sensing means comprises an adjustable height spring or rigid structure supporting a first contact, a second contact means coupling said contacts to a source of energy and means coupling said heating means to said contacts.

4,057,213

SEAT FOR WORK MACHINE OR VEHICLE

Kalevi Kokkila, Tampere, Finland, assignor to Rauma-Repola Oy, Finland

Filed Jan. 19, 1976, Ser. No. 650,034
Claims priority, application Finland, Feb. 6, 1975, 0331/75
Int. Cl.[2] A45D *19/04*
U.S. Cl. 248—385 **6 Claims**

1. A driver's seat assembly in a work machine or vehicle for minimizing shock to the driver caused by sudden lateral and angular changes in position due to uneven terrain while permitting the driver to maintain maximum control over the control elements of said work machine or vehicle, said seat assembly comprising:

a. a seat member;

b. means for pivotably mounting said seat member in a work machine or vehicle for restricting movement of said seat member to lateral motion or swinging, said means for pivotably mounting being positioned at the cab floor, having a pivot axis in proximity to the floor, the pivot axis being generally parallel to a longitudinal axis of the work machine or vehicle; and

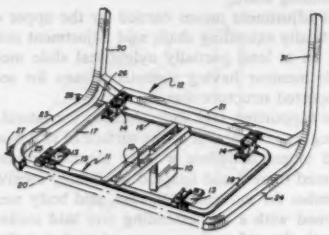
c. means connected to said seat member and to said work machine or vehicle for damping lateral movement and absorbing the lateral shock caused by sudden changes in contour of terrain.

4,057,214

SEAT WITH ENERGY ABSORBING MOUNTING

Arthur J. Harder, Jr., Franklin Park, Ill., assignor to Coach and Car Equipment Corporation, Elk Grove Village, Ill.

Filed July 26, 1976, Ser. No. 708,481
Int. Cl.[2] A47C *3/025*
U.S. Cl. 248—399 **9 Claims**



1. In a seat:

a base;

a horizontally disposed seat frame having front and rear members each located above said base;

front and rear energy absorbing means, cantilevered inwardly from said front and rear members of the seat frame, respectively, for resiliently mounting said respective front and rear members on said base;

each of said energy absorbing means comprising a block of elastic, resilient material having upper and lower horizontal surfaces and parallel, inclined inner and outer surfaces extending upwardly from said lower surface in an outward direction relative to said seat frame;

each inclined surface having a bottom edge at said lower horizontal surface and a top edge at said upper horizontal surface;

top and bottom plates attached to said upper and lower horizontal block surfaces respectively;

both of said inclined surfaces on each of said blocks being substantially totally exposed to facilitate unrestricted flexing thereof;

each top plate comprising an end portion located outwardly of the top edge of said outer inclined block surface;

means for connecting said end portion of said top plate of the front energy absorbing means to the front member of said seat frame;

means for connecting said end portion of said top plate of the

rear energy absorbing means to the rear member of said seat frame;

and means for connecting the bottom plate of each of said energy absorbing means to said base.

4,057,215

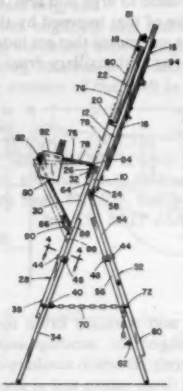
COLLAPSIBLE EASEL FOR ARTISTS

Gene A. Stettler, 641 Florida Ave., York, Pa. 17404

Filed Aug. 12, 1976, Ser. No. 713,716

Int. Cl.[2] A47B 97/08

U.S. Cl. 248—460 6 Claims



1. A collapsible easel for use by an artist comprising in combination, an elongated relatively narrow normally horizontal frame member having opposite faces, a relatively narrow support member connected at one end to said frame member and extending perpendicularly therefrom, a first pair of longitudinally adjustable legs pivotally connected at one end to opposite end portions of one face of said frame member, a second pair of longitudinally adjustable legs pivotally connected at one end to opposite end portions of the other face of said frame member, the legs of said pairs being perpendicular to the elongated axis of said frame member and said pairs of legs respectively being pivotally movable in opposite directions relative to each other through arcs of substantially 180° relative to the elongated axis of said frame member respectively between compact folded position adjacent opposite surfaces of said support and extended supporting positions in which said legs all extend from said frame member in opposite directions from said support, a pair of normally horizontal rails extending transversely to the vertical axis of said support member and relatively adjustable to said member and each other, said rails also having grooves therein facing each other to engage opposite horizontal edges of an artist's canvas or boards, a pair of elongated panels hingedly connected along one edge to each other, means connecting the opposite edge of one panel to said frame member to form a shelf when extending horizontally in use from said frame member, the other panel comprising a brace and being adapted to extend downward and inward from the outer edge of said shelf panel for engagement with the first pair of legs to brace said shelf panel substantially in operative horizontal position, pin means adjustably positionable longitudinally at desired selected positions along said first pair of legs below the pivotal connection thereof to said frame member and said first pair of legs having similar rows of holes extending transversely therein to receive said pins in similar selected holes in each row for engagement by the lower edge of said brace panel when the pairs of legs are disposed in downwardly extending supporting position for said horizontal frame member and support thereon, and said panels further being adapted to be disposed in extended planar relation to each other and be hingedly moved into a compact extended position overlying the normally front face of said support member and protect the face of any painting or artist's panel mounted upon said support member for carrying purposes.

4,057,216

ELECTROMAGNETIC VALVE

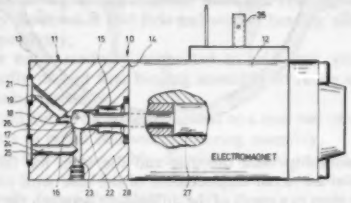
Heinz Flaschar, Asperg, and Heinz Gand, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 22, 1976, Ser. No. 651,470

Claims priority, application Germany, Feb. 4, 1975, 7503234[U]

Int. Cl.[2] F16K 31/06

U.S. Cl. 251—129 12 Claims



1. An electromagnetic valve, comprising a valve housing having an elongated bore formed with a valve seat, said bore comprising a plurality of portions which successively decrease in cross-section in the direction of the elongation of said bore towards the interior of said valve housing so as to include a largest bore portion, a medium-sized bore portion and a smallest bore portion; a fluid inlet port and a fluid outlet port communicating with said bore at opposite sides of said valve seat, said fluid outlet port comprising a longitudinally-extending passage and a transverse passage communicating with said longitudinally-extending passage and extending in direction transversely of the elongation of said bore until said transverse passage reaches said medium-sized bore portion; a valve member movable in said bore between first and second positions in which it respectively engages and is spaced from said valve seat; and electromagnetic means having a portion engageable with said valve member and being movable between one position and another position in which it respectively permits and prevents movement of said valve member between said first and second positions thereof.

4,057,217

VALVE CONSTRUCTION

Peter S. MacDonald, Ironia, N.J., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 433,330, Jan. 14, 1974, abandoned. This application Aug. 4, 1975, Ser. No. 601,714

Int. Cl.[2] F16K 1/22

U.S. Cl. 251—308 23 Claims

16. A valve for controlling the flow rate of a fluid even with temperature changes including:

a housing;

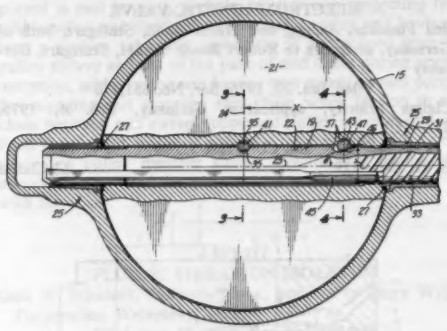
a stem having an axis and pivotal relative to the housing on the axis of the stem as a fulcrum and having a first rate of expansion or contraction in response to such temperature changes;

a disc mounted on the stem interiorly of the housing, the disc being pivotable with the stem to open and close the valve and having a second rate of expansion or contraction in response to such temperature changes where the second rate is different from the first rate;

first means interconnecting the stem and the disc at an intermediate position along the axial length of the stem in the housing and providing a reference for any difference between the first rate of expansion or contraction of the stem in response to the temperature changes and the sec-

ond rate of expansion or contraction of the disc in response to the temperature changes; and

second means interconnecting the disc and the stem at a position displaced from the first means and in a slidable



relationship with the disc and the stem for facilitating radial and axial displacement of the disc with respect to the stem as a result of the differences between the first and second rates of expansion or contraction to inhibit angular displacement of the disc relative to the stem.

4,057,218

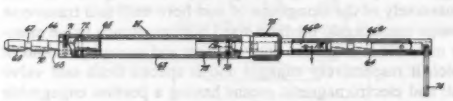
WINCH-HOIST ACTUATING APPARATUS

Bernard E. Wallace, Exton, Pa., assignor to B. E. Wallace Products Corporation, Malvern, Pa.

Division of Ser. No. 453,919, March 22, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 604,963

Int. Cl.[2] B66D *1/00*

U.S. Cl. 254—167 **6 Claims**



4. For a winch-hoist of the character described, having a socket-equipped operating lever and a tubular manually-actuated handle which is adjustable in length and having an interior hollow formed as a container for removable spare parts; an overload-relieving link of rod formation adapted to cooperate with such a lever and such a handle, said link having two spaced-apart seating areas for cooperation with a lever socket to secure said link to said lever, a zone between said areas having a reduced diameter with respect to said seating areas and adapted to cooperate with a removable holding device, and an elongated zone extending from one of said seating areas and into the interior of such handle and including a portion adapted to be exposed and so proportioned as to bend under a predetermined overload without the bending of the handle; sleeve and means interposed between said tubular handle and said elongated zone to releasably secure said elongated zone in the interior of said handle.

4,057,219

COUNTERPOISING LOAD SUPPORT APPARATUS AND METHOD

Valentine S. Sobolewski, Muskego, Wis., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 574,581, May 5, 1975, Pat. No. 4,003,552. This application Sept. 8, 1976, Ser. No. 721,363

Int. Cl.[2] B66D *1/48*

U.S. Cl. 254—175 **3 Claims**

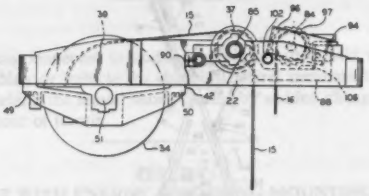
1. A safety device for use with apparatus including a main cable for supporting a load and means for taking up and feeding out said main cable for raising and lowering said load, said safety device comprising:

arm means including means for supporting said arm means for pivoting about an axis,

means on said arm means over which said main cable passes to support said load and impose a force on said arm means which tends to pivot said arm means in a first rotational direction about said axis,

spring means interposed between said support means and arm means remote from said axis such that said spring means are normally active when there is a predetermined stress in said main cable to urge said arm means to pivot in a direction opposite of that imposed by the main cable,

auxiliary drum means and means that are independent of said arm means supporting said auxiliary drum means normally



for free rotation, said auxiliary drum means being constructed and arranged for winding and unwinding an auxiliary cable therefrom which auxiliary cable is attached at one end to said drum means and at another end to said load, said main cable normally providing substantially all of the support for said load,

ratchet wheel means having teeth in its periphery and attached to said auxiliary drum means for joint rotation therewith,

pawl means mounted on said arm means such as to be clear of said ratchet wheel teeth when said arm means is pivoted in said first direction, loss of said predetermined stress in said main cable causing said arm to pivot in an opposite direction under the influence of said spring means to thereby engage said ratchet wheel to prevent its rotation and transfer said load to said auxiliary cable.

4,057,220

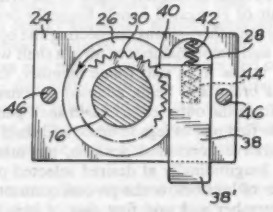
RATCHET TYPE OPERATOR FOR CABLE WINCHES AND THE LIKE

Donald S. Kudlacek, 3412 Oak St., Longview, Wash. 98632

Filed June 10, 1976, Ser. No. 694,658

Int. Cl.[2] B66D *1/00*

U.S. Cl. 254—186 HC **4 Claims**



1. A ratchet type operator for a rotatable shaft, comprising:

a. a base,

b. a first cavity in the base,

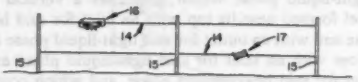
c. a shaft,

d. a ratchet gear secured to one end of the shaft and confined within the first cavity,

e. a second cavity in the base tangent to and communicating with the first cavity,

f. a ratchet arm within and guided by the second cavity for reciprocation tangentially with respect to the ratchet gear,
g. a ratchet dog on the ratchet arm extending laterally therefrom and arranged for releasable engagement with the ratchet gear, at a point displaced circumferentially from a diametrical line extending through the ratchet gear normal to the direction of reciprocation of the ratchet arm whereby a force on the ratchet dog is transferred through the ratchet arm and substantially entirely along an outer longitudinal edge of the second cavity by an outer longitudinal edge of the ratchet arm minimizing the shear forces on the ratchet dog, and
h. spring means engaging said ratchet arm for urging the ratchet dog resiliently into engagement with the ratchet gear, allowing rotation of the shaft in one direction and preventing rotation of the shaft in the opposite direction.

4,057,221
WIRE TIGHTENING TOOL
Jimmie E. Leath, 1909 W. Wall, Midland, Tex. 79701
Filed Sept. 17, 1976, Ser. No. 724,303
Int. Cl.[2] B21F *27/00*
U.S. Cl. 256—40 **17 Claims**



1. A tool for stretching the individual strands of a barbed wire fence from a slack into a taut condition comprising:
a wire engaging member which is cylindrical in form and includes a reduced diameter midportion, and opposed ends; said member having means forming spaced first and second slots therewithin for initially engaging spaced marginal lengths of the slack wire, said slots extend from one said end towards said midportion and opens in an outward direction;
spaced first and second tabs for subsequently holding the tool respective to other spaced marginal lengths of the tightened wire;
said slots and said first of said tabs are arranged on one end of said member and in spaced relationship respective to one another; the second of said tabs being arranged on the end of the member which is opposed to the first of said tabs; to thereby enable said slots to engage the first recited spaced marginal lengths of the wire, and said tool can then be rotated to wind another marginal length of wire upon the tool, and thereafter said tabs can engage the wire to prevent unwinding of the tool respective to the wire.

4,057,222
CONCRETE VIBRATOR
John S. Lyle, Denver, Colo., assignor to Koehring Company, Milwaukee, Wis.
Filed Feb. 17, 1976, Ser. No. 658,594
Int. Cl.[2] B01F *1/00*; F01C *1/10*; F03C *3/00*; F04C *1/06*
U.S. Cl. 366—123 **1 Claim**

1. Apparatus for vibrating a flowable medium, such as poured concrete aggregate, comprising:
an end cap;
a first tubular section having a front-end threadedly connected to a rear end of said end cap;
said first tubular section having a rearwardly facing shoulder;
a first bearing assembly mounted within said first tubular section adjacent a front end thereof in abutting relationship with said rearwardly facing shoulder;
a second tubular section having a front end threadedly connected to a rear end of said first tubular section;
said second tubular section having a first forwardly facing shoulder and a second forwardly facing shoulder spaced rearwardly therefrom;
a second bearing assembly mounted in said second tubular section in abutting relationship with said first forwardly facing shoulder;
an unbalanced mass disposed in said first tubular section, said mass having axially opposed front and rear pintles rotatably mounted in said first and second bearing assemblies, respectively;
a first nut threadedly connected to said front pintle forwardly of said first bearing assembly to retain said first bearing assembly;
a second nut threadedly connected to a rear end of said rear pintle to retain said second bearing assembly;
a third bearing assembly disposed in said second tubular section in abutting relationship with said second forwardly facing shoulder;
a third nut rotatably mounted in said third bearing assembly and including a forward projection removably received in a rearwardly open slot of said second nut to form a rotary drive connection therebetween;
a stationary ring disposed at a rear end of said second tubular section;
a closure connected to said second tubular section by removable fasteners extending through said stationary ring, to secure said stationary ring between said second tubular section and said closure;
a shaft having a front end rotatably mounted in a needle bearing in said second tubular section and a rear end rotatably mounted in a needle bearing in said closure, said shaft extending through a bore of said stationary ring;
the front end of said shaft being threadedly connected to said third nut to form a rotary drive connection therebetween;
an internally toothed ring journalled for rotation in said bore of said stationary ring;
an externally toothed rotor keyed on said shaft for rotation within said internally toothed ring;
said internally toothed ring having one tooth less than said rotor;
a first sealing ring held between a front end of said stationary ring and a rear end of said second tubular section to form a fluid seal therebetween;
a second sealing ring held between a rear end of said stationary ring and a front end of said closure to form a fluid seal therebetween;
a fluid inlet conduit and a fluid outlet conduit extending through said closure in directions parallel to one another and parallel to the axis of said shaft;
said inlet conduit being connectible to a source of pressurized hydraulic fluid;
a first pair of arcuate slots located in a forward face of said closure in fluid communication with said inlet and outlet conduits, respectively;
said first pair of slots facing rearward faces of said internally toothed ring and said rotor and communicating with spaces between such ring and rotor, to conduct hydraulic fluid thereto and therefrom for rotatably driving said shaft and said unbalanced mass;
said first pair of slots extending beyond an outer periphery of said internally toothed ring and communicating with cut-outs formed in the bore wall of said stationary ring to conduct hydraulic fluid across the outer periphery of said internally toothed ring to lubricate the latter;
a second pair of slots located in a rear face of said second tubular section and facing front faces of said internally

toothed ring and said rotor in axial alignment with respective ones of said first pair of slots, to equalize pressures at the front and rear faces of said internally toothed ring and said rotor;

a fluid seal disposed around said shaft in said second tubular section axially between said third bearing assembly and said rotor to prevent the passage of hydraulic fluid to said unbalanced mass;

retaining means disposed forwardly of said fluid seal and rearwardly opposite said third bearing; and

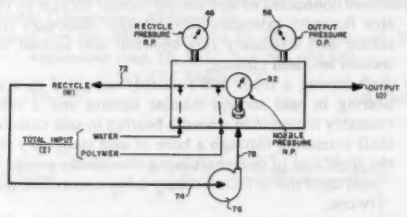
said closure having a hole aligned with said shaft, to facilitate removal of said needle bearing from said closure.

4,057,223

MIXING BLOCK FOR MIXING POLYMERS

Roy R. Rosenberger, Wheaton, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 3, 1975, Ser. No. 619,551
Int. Cl.² B01F *15/00, 5/16;* E03B *1/00*
U.S. Cl. 366—172 **5 Claims**



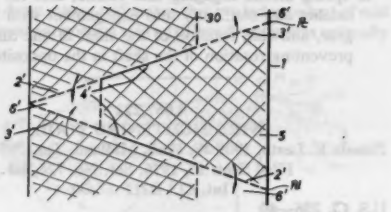
1. A device for rapidly mixing high viscosity fluid from a high viscosity fluid source with water from a water source comprising a substantially rectangular block with a bore extending throughout its entire length, said bore having a center section, a first end section and a second end section with the center section of the bore being of smaller diameter than the first end section, with the first end section containing a recycle outlet and defining a pre-mixing chamber for mixing the high viscosity fluids and the water with the center section partially outwardly flared where it joins the pre-mixing chamber with said flared portion having an apex and a base with the second end section defining an outlet port for discharging a mixture of high viscosity fluids and water, a high viscosity fluid inlet nozzle in communication with the apex of the flared portion of the pre-mixing chamber, said nozzle being adapted to adduct high viscosity fluids into the pre-mixing chamber, a water inlet in communication with the pre-mixing chamber, means for determining the pressure within the pre-mixing chamber, adjustable flow restricting means positioned within the center section of the bore, said flow restricting means being adapted to regulate the flow through the pre-mixing chamber and through the second end section wherein the adjustable flow restricting means is a cylindrical plug having a bevelled face in partial communication with the center section of the bore, a recycle inlet in communication with said adjustable flow restricting means and recycling means comprising a pump and fluid conductors connecting the recycle outlet and the recycle inlet for recycling a portion of a mixture of high viscosity fluid and water.

4,057,224

PROCESS AND APPARATUS FOR DIRECTLY CONTACTING TWO COUNTERFLOWING IMMISCIBLE LIQUID PHASES

Eckart Müller, Bergen-Enkheim; Thomas Simo, Frankfurt am Main; Helmut Markwort, and Berthold Scholz, both of Oberursel, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 10, 1976, Ser. No. 749,335
Claims priority, application Germany, Dec. 19, 1975, 2557327
Int. Cl.² B01F *15/02*
U.S. Cl. 366—336 **22 Claims**



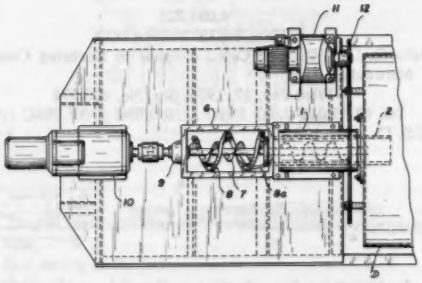
14. In an apparatus for contacting a heavy-liquid phase with a light-liquid phase which comprises a vertical cylindrical vessel formed near its top with an inlet for said heavy-liquid phase and with an outlet for said light-liquid phase and near its bottom with an inlet for said light-liquid phase and with an outlet for said heavy-liquid phase, and which contains plates having perforations forming flow passages for the light-liquid phase and perforations forming flow passages for the heavy-liquid phase and disposed above the perforations forming flow passages for the light-liquid phase, the superposed perforated portions forming mixing zones for mixing the two liquid phases occupying 10–30% of the cross-sectional area of the vessel, the plates being unperforated in an area which occupies 40–80% of the cross-sectional area of the container so that this area and an area which occupies 10–30% of the cross-sectional area of the container and through which liquid is withdrawn define a separating zone for the liquid phases, the improvement wherein said separating zone is filled with a material which accelerates coalescence.

4,057,225

SCREW FEEDER FOR GRANULAR MATERIAL

Roy E. Ferree, Valencia, Pa., assignor to ESM Inc., Valencia, Pa.

Filed July 14, 1976, Ser. No. 705,091
Int. Cl.² B01F *9/08, 15/02*
U.S. Cl. 366—157 **3 Claims**



1. A screw feeding apparatus for particulate matter, comprising a feed chamber in which is mounted a pair of concentric augers which are substantially co-extensive in length,

variable speed drive means for driving the inner auger of smaller diameter, a rotating housing rigidly connected, at one end, to the outer auger of greater diameter and surrounding a portion of the inner auger, a drum rigidly connected at the other end of said rotating housing, and a separate driving means for driving said drum about its axis.

4,057,226

MIXING DEVICE

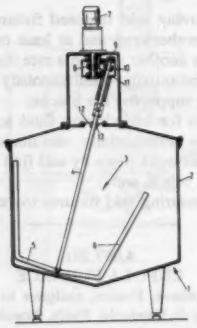
Jacob Mink de Mos, Warnsveld, and Pieter Koek, Eefde, both of Netherlands, assignors to N.V. Machinefabriek Terlet, Zutphen, Netherlands

Filed Dec. 26, 1973, Ser. No. 427,553

Claims priority, application Netherlands, Aug. 29, 1973, 7311901

Int. Cl.² B01F *7/00*

U.S. Cl. 366—244 1 Claim



1. A mixing device comprising, in combination:

a vessel having a bottom, a side wall defining a vessel axis and a top, all defining a closed space of circular cross section for receiving material to be mixed, said top having a central opening therein;

a mixing shaft projecting through said opening into said closed space at an inclination to said vessel axis to present an inner end within said vessel reaching to adjacent said bottom and an outer end outside said vessel;

flexible sealing means joining a section of said shaft between its ends to said cover whereby hermetically to isolate said space and establish a pivot substantially on said vessel axis;

blade means on the inner end of said shaft and including portions radially offset therefrom; and

drive means connected to said outer end of the shaft for orbiting said outer end without causing rotation of said shaft whereby said inner end of the shaft sweeps a conical path within said vessel, said portions of the blade means being radially offset from said conical path sufficiently to reach into close proximity with said side wall of the vessel, said drive means comprising a drive shaft aligned with said vessel axis, an arm fixed to said drive shaft and bearing means rotatably connecting said outer end of the mixer shaft to said arm in offset relation to said drive shaft, said blade means being fixed to said inner end of the mixer shaft and including means engaging said outer end of the mixer shaft preventing rotation thereof, the means last mentioned comprising a bracket pivoted about an axis normal to said vessel axis and having a slot extending in the direction of the bracket axis, said outer end of the mixer shaft being non-rotatably guided in said slot.

4,057,227

METHOD FOR MAKING CERAMIC CASTING SLURRIES

Carlton E. Cruff, Manchester, and Edward G. Day, Rocky Hill, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 27, 1976, Ser. No. 718,265

Int. Cl.² B28C *5/46*

U.S. Cl. 366—2 9 Claims

1. A method for rapidly preparing a ceramic slurry having controlled viscosity, density and the like for use in forming casting molds, wherein a liquid binder ingredient and insoluble ceramic particulate ingredients of various particle sizes are mixed in a container, comprising the steps of:

placing the slurry ingredients in the container in the desired amounts, including removing sufficient air from the container to prevent subsequent air entrapment in the slurry ingredients;

mixing the slurry ingredients by epicyclic agitation to effect rapid wetting and homogenization thereof, substantial air entrapment in the ingredients being prevented during mixing by said prior removal of air from the container; and

terminating said agitation and removing the ceramic slurry from the container for immediate use in forming casting molds, total slurry preparation time, including placement of the ingredients in the container and epicyclic mixing, being archievable within one hour.

4,057,228

MIXING OF MATERIALS

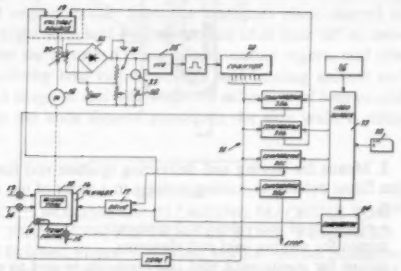
Martin Völker, and Heinz Mühlhoff, both of Langenhagen, Germany, assignors to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Jan. 29, 1975, Ser. No. 545,136

Claims priority, application Germany, Jan. 30, 1974, 2404292

Int. Cl.² B29B *1/06*

U.S. Cl. 366—79 6 Claims



1. In an apparatus for mixing materials which includes a mixing chamber, a mixing tool, and a motor driving the mixing tool, the improvement comprising:

first means connected to the motor to derive therefrom a signal representative of the power consumption of the motor during operation under mixing load;

second means providing a correcting signal representing power consumption of the motor when driving the mixing tool, but without mixing and being connected to the first means to provide a signal representing the difference between the signal as provided by the first means and the correcting signal;

third means connected to be responsive to the different signal to provide a train of pulses at a frequency representing true mixing power;

counter means connected to the third means for connecting the pulses as provided by the third means;

externally programmable reference means responsive to external control manifestations and providing presettable digital reference signals representing predetermined mixing states in terms of work needed to obtain said state;

means connected to the programmable reference means to provide thereto corrective values representing deviations of said predetermined work, so as to modify said reference signals;

comparator means connected to said reference means, and said counter means for controlling the duration of mixing in response to agreement between the digital reference signals provided by the reference means and the state of the counter;

means for sensing the temperature of the mixture in the chamber; and

means connected to the means for sensing, for controlling the mixing operation in additional dependency upon temperature of the substance being mixed to reduce mixing power as expanded in the case of detecting a predetermined excess temperature.

4,057,229

IGNITION ROD AND FEED DEVICE

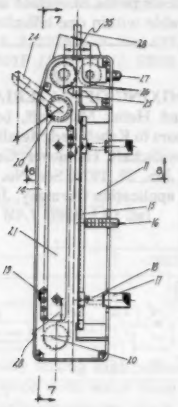
J. A. Zeley, Apartado Postal 60061, Caracas, Venezuela

Filed Mar. 29, 1976, Ser. No. 671,110

Claims priority, application Germany, Mar. 27, 1975, 2513584

Int. Cl.² B23K *7/06*

U.S. Cl. 266—48 **9 Claims**



1. Means for storing and delivering ignition rod for an oxygen flame cutting or joining process to a point of use comprising:

a plurality of individual rod elements,

means for storing said rod elements,

means for positioning said rod elements in end to end fashion,

means for joining said rod elements together to form a single ignition rod, and

means for delivering said ignition rod to the point of use.

4,057,230

DIE QUENCH MACHINE AND METHOD

Raymond H. Hays, and Kenneth D. Gladden, both of East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1976, Ser. No. 663,593

Int. Cl.² C21D *1/66, 9/30*

U.S. Cl. 266—117 **8 Claims**

1. Die quenching apparatus, comprising:

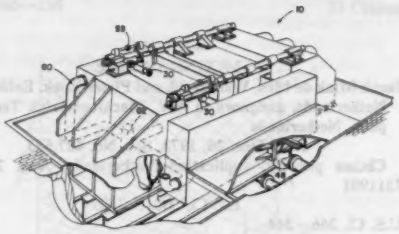
1. a pair of relatively horizontally movable opposed platens;

2. a plurality of die blocks supported on the first of said platens;

3. a corresponding plurality of die blocks supported on the second of said platens for cooperation with said first platen and die blocks, said first and second die blocks each having an internal cavity and further having generally opposed outer surfaces for receiving and substantially surrounding a first plurality of portions of a work piece when said platens are moved towards each other;

4. a plurality of relatively small fluid passageways extending through the opposed surfaces of said die blocks, said passageways providing fluid communication with said die block cavities;

5. a plurality of opposed fixtures movable together relative to said platens for holding said work piece at its ends in said die blocks;



6. means for moving said opposed fixtures wih said work piece held therebetween and at least one of said platens relative to one another at such a rate that said work piece is grasped substantially simultaneously by said first and second platen supported die blocks;

7. quench means for introducing fluid to each of said die block cavities substantially simultaneously with said grasping of said work piece by said first and second platen supported die block; and

8. means for pressuring said fixtures towards one another.

4,057,231

CUPOLA FURNACE

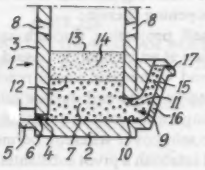
Louis G. Chazé, Rennes, France, assignor to Centre Technique des Industries de la Fonderie, Paris, France

Filed June 6, 1975, Ser. No. 584,387

Claims priority, application France, June 27, 1974, 74.22491

Int. Cl.² F27B *1/20*

U.S. Cl. 266—219 **6 Claims**



1. A cupola furnace for containing molten iron and slag with the slag on top of the molten iron and from which both the molten iron and slag are removed discontinuously, said furnace comprising a crucible with a lower wall and a wall extending upwardly from said lower wall for containing said molten iron with said slag on the top of said molten iron, one said wall having a first opening at said lower wall of said crucible for removing molten iron from said crucible at said lower wall and said upwardly extending wall having a second opening therein at said lower wall of said crucible and spaced from said first opening, and a siphon tube with an inlet and an outlet having its inlet connected to said second opening and having its outlet above the uppermost portion of said second opening, said first opening being disposed to permit removal of said molten iron until the upper level thereof is spaced from said lower wall by a distance no greater than the distance between said lower wall and the uppermost portion of said first opening, and said second opening being disposed and having a size such that said

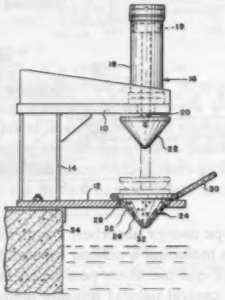
uppermost portion thereof is above said uppermost portion of said first opening and the lowermost portion of said second opening is at least as close to said lower wall as said uppermost portion of said first opening, whereby said crucible may contain molten iron and slag having upper levels above said uppermost portion of said second opening, the molten iron may be withdrawn through said first opening until the upper level thereof is at most as low as said uppermost portion of said first opening and until said slag passes through said second opening into said tube and thereafter, the level of said molten iron may be raised to cause said slag to flow out of said outlet.

4,057,232

PRESS FOR SEPARATING MOLTEN METAL FROM DROSS

George P. Ross, and James L. Bedortha, both of Steubenville, Ohio, assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1976, Ser. No. 737,110
Int. Cl.² C22B *19/00*
U.S. Cl. 266—227 **4 Claims**



1. In a power driven press for separating molten metallic zinc from dross in the operation of a zinc-coating apparatus for coating metal and having a zinc pot for containing a molten zinc bath through which the metal to be coated is drawn,

a source of power in the form of a pressurized fluid motor having a piston reciprocable in the cylinder,

ram means arranged to be driven from the source,

a ladle in the form of a skimmer including an elongated handle to enable hand-manipulation to collect and contain dross to be pressed, the skimmer having a perforated wall defining a convex outer surface,

support means in the form of a rigid C-frame for the ram and ladle, the lower arm of the C-frame having a ring-shaped seat therein having a surface substantially complementary to an outer surface portion of the skimming vessel and arranged to removably support the ladle on the C-frame in a fixed position under the ram,

a drive shaft for the ram reciprocably mounted in the upper arm of the C-frame and connected to the piston of the power source for reciprocably moving the ram toward and away from the ladle supported thereunder,

a ram head connected to the drive shaft, the ram head having a downwardly facing convex external surface,

the perforated wall having an upwardly facing concave internal surface substantially complementary in shape to the convex surface of the ram head,

the convex surface of the ram head and the concave wall surface of the ladle being arranged for concentrically interfitting relationship when the ram head is forcably driven into a mass of dross and molten zinc metal in the ladle and shaped to work the mass upwardly between the adjacent surfaces of the ram head and ladle to coalesce the vestiges of molten metal in the dross to form droplets by applying pressure against the dross and molten metal constituting the mass to force the molten metal through the perforations in the ladle wall, and

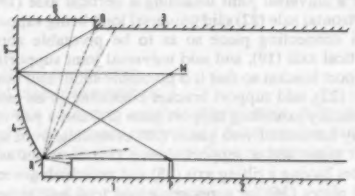
means rigidly mounting the C-frame on the zinc pot with the seat thereon extending over the pot whereby molten zinc metal expressed from the mass of dross is collected in the pot.

4,057,233

CONTINUOUS FURNACE

Robert Spessert, Bergisch Gladbach, Germany, assignor to "OFU" Ofenbau-Union GmbH, Dusseldorf, Germany

Filed July 8, 1976, Ser. No. 703,503
Claims priority, application Germany, July 10, 1975, 2530794
Int. Cl.² C21D *1/12*
U.S. Cl. 266—252 **8 Claims**



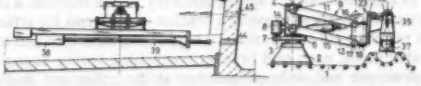
1. A continuous furnace for metal elongated objects arranged in transversely extending disposition for travel along a plane through the furnace, said furnace comprising a chamber including inner side walls and a heating surface arranged in spaced relation with respect to the transport plane of the objects for directing heat radiation theretowards to heat said objects, said side walls including a first region closer to the transport plane concave inwards in shape and forming an angle with said transport plane or more than 90° as measured from the transport plane to said first region, said side walls including a second region further from the transport plane shaped to form an angle with said transport plane of at least 90° as measured from the transport plane to said second region, said side walls receiving heat radiation from said heating surface and due to the shape of said side walls the reflection of heat to said objects at the ends thereof proximate the side walls is minimized.

4,057,234

TAPHOLE BORING OR PLUGGING MACHINE FOR SHAFT FURNACES, ESPECIALLY BLAST FURNACES

Eberhard Brücher, Siegen-Weidenau, and Karl-Heinz Schüssler, Siegen, both of Germany, assignors to Dango & Dienenthal, Siegen, Germany

Filed Sept. 29, 1975, Ser. No. 617,775
Claims priority, application Germany, Mar. 6, 1975, 2509805
Int. Cl.² C21B *7/12*
U.S. Cl. 266—272 **2 Claims**



1. A taphole boring or plugging machine for shaft furnaces and especially blast furnaces and particularly those which operate under high pressures, by means of which tapholes may be bored and sealed at various heights of said furnaces and at various angles in said furnaces which comprises:

a console mounted on the mill floor and including a vertical column;

a sleeve supported on said vertical column and pivotable about the vertical axis of said column;

drive means operatively associated with said sleeve for pivoting said sleeve about said column;

a machine tool arm having one end pivotally connected to said sleeve;

a support bracket provided at the other end of the machine tool arm;

a tool holding carriage or sealing gun supported by the support bracket;

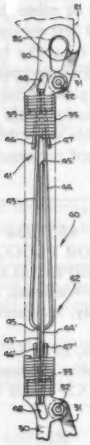
wherein said machine tool arm (9) comprises two parallel links, one end of each of said links being connected to said sleeve by means which permit each of said links to pivot about a horizontal axis; and a connecting piece (18) pivotally connected to the other end of each of said parallel links and forming a paralellogram the sides of which consist of said links, said sleeve and said connecting piece; and a universal joint including a vertical axle (19) and a horizontal axle (22) said universal joint being supported by said connecting piece so as to be pivotable about said vertical axle (19), and said universal joint supporting said support bracket so that it is pivotable about said horizontal axle (22), said support bracket consisting of an essentially vertically extending support plate (32) and a pair of essentially horizontal web plates (33) extending from said support plate and a support sleeve (34) between said web plates having a tilting axis (35) and on which are mounted end plates (36) for supporting said tool holding carriage (37).

4,057,235

SPRING RETAINER FOR GARAGE DOOR HARDWARE

William Halopoff, 17720 Crusader St., Cerritos, Calif. 90701

Filed June 3, 1976, Ser. No. 692,288
Int. Cl.[2] F16F *1/12*
U.S. Cl. 267—73 5 Claims



1. In a counterbalance spring assembly which includes a coil counterbalance spring having a bracket at each end for attachment respectively to a stationary supporting structure and to a movable panel, each said bracket comprising spring engaging means at one end, a hook member at the other end and an intermediate portion exterior with respect to the spring having a transversely extending opening therethrough, and a safety device for restraining parts of the spring in event of rupture of the counterbalance spring when under tension,

said safety device comprising a pair of mutually extendable elongated composite retention elements each having a length not exceeding the length of the counterbalance spring in retracted position of the counterbalance spring,

an inner section of each of the retention elements located intermediate opposite ends of the spring having a sliding engagement with the other of the retention elements,

and an outer section of each retention element adjacent the corresponding end of the spring being attached to a respective one of said brackets at the intermediate portion thereof,

interlocking means on the inner section of said retention elements operative when the counterbalance spring is at substantially the full extended position,

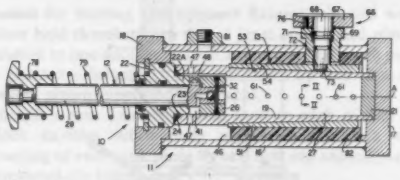
said retention elements having yieldable stop means operable when the counterbalance spring ruptures under tension whereby to prevent rupture of the safety device.

4,057,236

ENERGY ABSORBER

Ransom J. Hennells, 45500 N. Territorial Road, Plymouth, Mich. 48170

Continuation-in-part of Ser. No. 608,885, Aug. 29, 1975. This application May 14, 1976, Ser. No. 686,585
Int. Cl.[2] F16F *9/48*
U.S. Cl. 267—116 10 Claims



1. In a fluid-type energy absorber, comprising:

housing means including a central tubular housing member and a pair of end members positioned adjacent opposite ends of said central tubular housing member;

sleeve means disposed in said housing means for forming a first fluid chamber within the interior of said sleeve means and a second fluid chamber between said sleeve means and said tubular housing member;

ram means slidably disposed on said housing means for receiving a shock load thereon, said ram means including a piston slidably disposed within one of said fluid chambers and piston rod means connected to said piston and extending outwardly from said housing means;

opening means associated with said sleeve means for permitting controlled flow of fluid from said one chamber into the other chamber to decelerate the ram means when the piston is moved axially of said one chamber in a first direction away from an initial impact position wherein it is disposed adjacent one end of said housing means;

a third fluid chamber formed at said one of said housing means directly behind said piston when same is moving in said first direction, said third chamber being in continuous communication with said other chamber;

one-way check valve means associated with said piston for permitting fluid flow therethrough from said third chamber into said one chamber when said piston is moving axially of said one chamber in a second direction which is opposite said first direction, said one-way check valve means preventing flow of fluid from said one chamber directly into said third chamber when said piston is moving in said first direction;

said one-way check valve means including first passage means formed in said ram means for providing communication between said third chamber and said one chamber, and a movable check valve member associated with said first passage means; and

second passage means for providing direct and continuous communication between said third chamber and said one chamber only when said piston is disposed in a position closely adjacent said one end of said housing means to

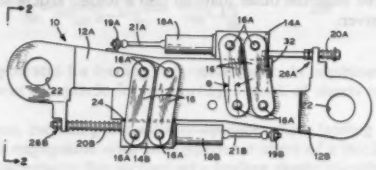
premit the flow of additional fluid into said one chamber as said piston is moving in said second direction, whereby said piston can be rapidly returned to said initial position, said second passage means being independent of said one-way check valve means.

4,057,237

SNUBBER

Joseph Daniel Nemeth, Clinton, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 19, 1976, Ser. No. 687,712
Int. Cl.[2] F16F *1/00*
U.S. Cl. 267—134 3 Claims



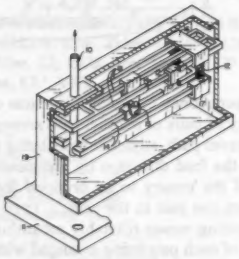
1. A snubber comprised of a pair of elongated members engaged in sliding frictional contact with one another, each member having an adjacently disposed restraining device, and means for connecting the device to the adjacent member and to the other member, the connecting means including means for pivotally linking the device to said other member.

4,057,238

ADJUSTABLE EFFECTIVENESS SUPPORT SPRING DEVICE

Wayne B. Lloyd, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 20, 1976, Ser. No. 688,496
Int. Cl.[2] F16F *7/00*
U.S. Cl. 267—136 2 Claims



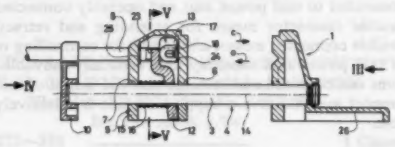
1. A vibration isolating support spring device, comprising
a mount member which may be subject to vibration,
a vertically movable rod for supporting connection to a load to be protected from vibration,
a horizontal lever means having an operative connection with said rod,
fulcrum means carried by said mount member and movable to different positions along said lever means in rockable support thereof,
compression coil spring means carried by said mount member and movable to different positions along said lever means in rod-force-opposing action thereon, and
adjustable means for simultaneously moving the fulcrum and spring means to their aforesaid different positions in behalf of balancing different external load conditions imposed on said rod.

4,057,239

VISE

Heribert Hopf, and Siegfried Schramm, both of Schwabisch Hall, Germany, assignors to Kelper GmbH, Schwabisch Hall, Germany

Filed Apr. 14, 1976, Ser. No. 676,915
Claims priority, application Germany, Apr. 26, 1975, 7513517[U]
Int. Cl.[2] B25B *5/02*
U.S. Cl. 269—170 23 Claims



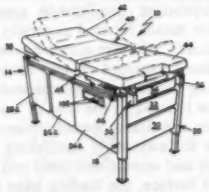
1. A clamp comprising:
a fixed clamping member;
a movable clamping member displaceable through a relatively long distance toward said fixed member in a closing direction and away from said fixed member in an opposite opening direction;
a tippable locking element having a hole;
an elongated locking element received in said hole said extending in said direction;
means for displacing said tippable element between a slide position with said hole loosely surrounding said elongated element and a locked position with said tippable element canted and said elongated element wedged in said hole; and
means expansible in said directions through a relatively short distance and including a nut bearing in one of said directions against one of said locking elements and a threaded element threaded through said nut and bearing in the other direction against one of said members, the other locking element bearing in the other direction against the other member.

4,057,240

EXAMINATION TABLE

Frank M. Damico, Hull, and Raymond D. Nass, Stevens Point, both of Wis., assignors to Joerns Furniture Company, Stevens Point, Wis.

Continuation of Ser. No. 609,171, Sept. 2, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,747
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—325 16 Claims



1. A variable height examination table for supporting a patient during a medical examination comprising: a cabinet including a top, a bottom, side walls and end walls defining storage space within said cabinet; a leg at each corner of said cabinet, generally at the junctures of said side and end walls whereby said legs do not interfere with said storage space of said cabinet, for supporting said cabinet on a support surface; patient support means mounted on said top of said cabinet, outside said storage space of said cabinet, for supporting a patient; each of said legs including a stationary section adapted

to rest on the support surface and a vertically movable section; and motive power means for raising and lowering said vertically movable leg sections, and thus said cabinet and patient support means, with respect to said stationary leg sections; said motive power means including a power unit mounted beneath said bottom of said cabinet outside said storage space, flexible connector means extending beneath said bottom of said cabinet to each said leg, said connector means being operably connected to each said leg for moving said vertically movable leg sections with respect to said stationary leg sections, power transfer means located beneath said bottom of said cabinet and connected to said power unit and operably connected to said flexible connector means for extending and retracting said flexible connector means, and means for controlling operation of said power unit whereby said vertically movable leg sections can be raised and lowered and the height of said patient support means above a support surface is selectively adjustable.

4,057,241

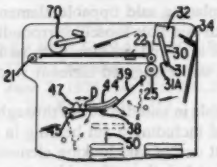
LAUNDRY FOLDER AND STACKER

Benjamin Alvin Buss, and Stephen A. Buss, both of 1315 23rd Ave. Court, East Moline, Ill. 61244

Continuation of Ser. No. 546,924, Feb. 4, 1975, abandoned. This application July 15, 1976, Ser. No. 705,459

Int. Cl.[2] B65H *45/02*

U.S. Cl. 270—82 **5 Claims**



1. In a laundry textile article folding and stacking machine, apparatus including endless belt conveyor means extending horizontally from front to rear of the machine for freely receiving an article to be folded placed on top thereof near the front of the machine and carrying the article to the rear thereof, the article having a leading edge in the direction of travel which is moved toward the rear of the machine by said conveyor means, said conveyor means including belt means supported by first and second roll means, said first roll means being toward the front of the machine and said second roll means being toward the rear thereof and over which said leading edge freely passes, third roll means juxtaposed relative to and below said second roll means in nip relationship with said second roll means for forming a folding station therewith, downwardly depending oscillatable arm means pivotally mounted on pivot means located generally above said second and third rolls means, said arm means having a lower end with folding blade means mounted on said lower end, said folding blade means being positioned opposite said folding station, an abutment surface located to the rear of said second and third roll means, motor and timing means connected to said oscillatable arm means for swingably oscillating said folding blade means relative to said second and third roll means and relative to said abutment surface, the leading edge of said article passing over said second roll means and over said blade means and depending downwardly to the rear of said blade means when said blade means is initially positioned near said second and third roll means, said blade means being swung away from said second and third roll means and toward said abutment surface after a predetermined length of said article from its leading edge has passed over said second roll means and over said blade means for holding said predetermined length of the article against said abutment surface for forming a loop in said article between said blade means and said second and third roll means, and the looped article then being moved toward and being inserted into the folding station between said second and third roll means by said blade means being swung toward said second and third roll means to fold said article, and a substantially planar stacking surface located below and adjacent the side of said second and third roll means toward the front of the machine, said stacking surface sloping downwardly and forwardly from said second and third roll means to receive folded articles from said folding station which freely slide onto said sloping surface and therealong, said stacking surface comprising a pair of swingable stacker plates each pivoted at an outside edge and having free edges therebetween which extend crosswise of the movement of an article down said plates, and the free edges of said plates overlapping each other, with the free edge of the plate nearest to the folding station being on top of the free edge the other plate so that a folded article will slide thereover.

4,057,242

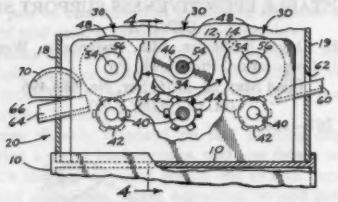
PAPER MONEY CRIMPING APPARATUS

Allen E. Rau, 702 E. 49th St., Tacoma, Wash. 98404

Filed Apr. 14, 1976, Ser. No. 676,929

Int. Cl.[2] B65H *5/06*

U.S. Cl. 271—3 **6 Claims**



2. New paper money crimping apparatus comprising:

a. a plurality of pairs of parallel rolls arranged along a linear money travel path, adjacent pairs being spaced from each other in the feed direction by a distance of less than the length of the money to be crimped for transferring the same from one pair to the next,

b. roll mounting means rotatably mounting the rolls,

c. the rolls of each pair being arranged with their surfaces in peripheral pressure engagement with each other,

d. one roll of each pair having a peripheral surface of resiliently deformable backup material,

e. the other roll of each pair having on its peripheral surface a plurality of relatively stiff embossing projections arranged in a selected pattern,

f. the roll of each pair being adapted to receive flatwise paper money to be crimped between their engaging surfaces and for passing it from one roll pair to the next,

g. infeed means for feeding fresh paper money to the first pair of rolls,

h. outfeed means for discharging crimped paper money from the last pair of rolls, and

i. drive means connected to the rolls for driving the same at a predetermined rotational speed,

j. the drive means comprising a constant speed electric motor for each pair of rolls, the motors being operated at substantially the same speed.

4,057,243

SHEET FEED TERMINATION DETECTOR

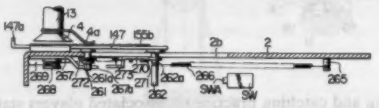
Sakae Fujimoto, Chofu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 375,887, July 2, 1973, abandoned. This application Apr. 2, 1975, Ser. No. 564,332

Claims priority, application Japan, July 11, 1972, 47-68666; July 24, 1972, 47-73923; July 24, 1972, 47-73926; July 27, 1972, 47-75449

Int. Cl.[2] B65H 7/04

U.S. Cl. 271—256 7 Claims



1. In apparatus for feeding successive sheets, in combination,
a. a sheet receptacle for supporting a stack of sheets to be fed;
b. means, including a cyclically operable sheet-feeding element engageable with the uppermost sheet of a stack on the receptacle, for successively feeding sheets therefrom;
c. a detecting member for detecting the termination of sheet delivery, said detecting member being movable, by an idling sheet-feeding operation of the feeding element when the sheets on the sheet receptacle have been exhausted, through a range of positions including a predetermined position;
d. means for producing a signal indicative of the detection of the termination of sheet delivery in response to movement of said detecting member to said predetermined position; and
e. means for controlling movement of said detecting member in response to idling operation of the feeding element such that said detecting member reaches said predetermined position upon completion of a predetermined plural number of idling sheet-feeding operations of said feeding element.

4,057,244

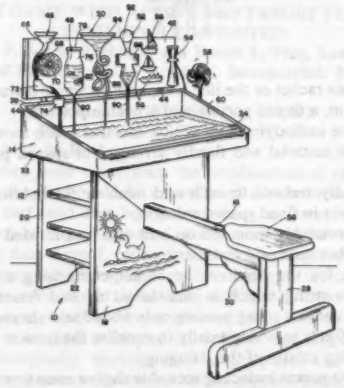
CHILD'S PLAY SEAT APPARATUS

Phyllis L. Gaspar, 6522 S. Erie, Tulsa, Okla. 74136

Filed Mar. 13, 1975, Ser. No. 558,139

Int. Cl.[2] A47B 39/12, 83/02

U.S. Cl. 272—1 A 6 Claims



1. A child's play seat apparatus comprising support frame means, box-like play area means carried at one end of the support frame means and having the upper side thereof open, tray means disposed in said play area means and insertable and removable through said open upper side of said play area means, and seat means secured to the support frame means and disposed in spaced relation to the play area means for supporting a child using the seat apparatus, wherein the support frame means comprises a pair of spaced upstanding wall members having a box-like play area secured at the upper end thereof, with said seat means secured to one of said wall members and extending outwardly therefrom, wherein the seat means comprises support arm means having one end secured to the outer surface of said one wall member and extending outwardly therefrom, and a straddle-type seat member secured to the opposite end of the support arm.

4,057,245

ATHLETE'S LANDING PIT STANDARD PROTECTOR

Donald W. Gordon, 2718 Standish, Anaheim, Calif. 92806

Filed Jan. 12, 1976, Ser. No. 648,228

Int. Cl.[2] A63K 3/04

U.S. Cl. 272—101 1 Claim

1. A landing pit for use by pole-vaulters, comprising:
a soft landing cushion;
a pair of standards positioned adjacent opposite sides of said landing cushion;
a pair of vertical posts supported by said standards;
a clearance bar horizontally extending between said vertical posts;
track means on said standards for permitting movement of said posts relative to said standards in a direction perpendicular to said clearance bar;
cushion members separate from said landing cushion positioned adjacent each of said pair of vertical posts, said cushion members completely overlapping said pair of standards, each of said cushion members comprising a pair of elongated members, one on each side of each post with the direction of elongation of each of said separate members being perpendicular to said clearance bar, said landing cushion having cut-out portions at its front corners defining spaces in which said standards and said cushion members are positioned and with the adjacent elongated sides of said members defining a slot overlying said track means; and
fastener means for holding said elongated cushion members against each of said posts, said fastener means being readily detachable to permit one of said elongated members to be easily moved for access to said standards and movement of said posts relative to said landing cushion and said cushion members along said track means.

4,057,246

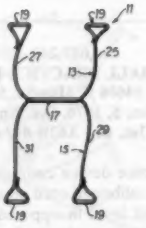
MULTIPURPOSE PUSH PULL EXERCISER

Bradford W. Wilson, 1642-A Coriander, Costa Mesa, Calif. 92626

Filed Mar. 15, 1976, Ser. No. 666,925

Int. Cl.[2] A63B 21/00

U.S. Cl. 272—137 9 Claims



1. A multi-purpose exerciser comprising:
first and second elongated flexible elements;
a tube means having a passage extending therethrough, said first and second elongated flexible elements extending

through said passage of said tube means; said tube means being of sufficient length to permit manual grasping thereof during exercise, and said tube means holding intermediate sections of said first and second elongated flexible elements together throughout the entire length of the tube means

said first elongated flexible element including first and second elongated, flexible segments projecting from opposite ends of said passage of said tube means, respectively;

said second elongated flexible element including third and fourth elongated, flexible segments projecting from opposite ends of said passage of said tube means, respectively;

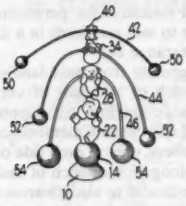
each of said elongated flexible segments being resilient and having an outer end remote from said tube means; and

means defining a handle on each of said elongated flexible segments adjacent the outer end thereof.

4,057,247
BALANCING TOY SET

Howard J. Morrison, Deerfield, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 4, 1975, Ser. No. 637,728
Int. Cl.² A63H *15/00*
U.S. Cl. 273—1 R **7 Claims**



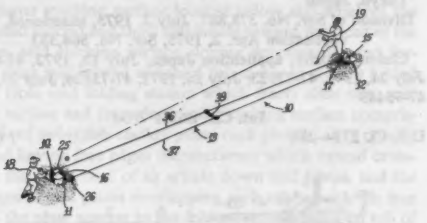
1. A balancing toy set, comprising: a base portion for positioning on a support surface such as a table or the like; and a plurality of balancing members each having complementary fulcrum portions at the tops and bottoms of at least some of the members for vertically stacking on the base, each balancing member having a pair of opposing outwardly and downwardly extending arms having weighted hollow spherical balls on the ends thereof, the arms being of sufficient length and weight so as to lower the center of gravity of the respective balancing members below the bottom of the respective member, said weights for the respective balancing members being of different amounts and the arms being of different lengths proportionate to the respective weights compared with the weights of other members so that the balancing members can be stacked on said base in a progressive upwardly decreasing series with the lightest weighted member at the top of the stack, and wherein said balancing members are of different sizes proportionate to the length of the arms and the amounts of the weights thereon.

4,057,248
BASEBALL PRACTICE DEVICE

William J. Stoecker, 14606 S. Hamlin, Midlothian, Ill. 60445

Filed Jan. 5, 1976, Ser. No. 646,603
Int. Cl.² A63B *69/40*
U.S. Cl. 273—26 R **6 Claims**

1. A baseball practice device comprising a pair of ground-engaging panels and calibrated cord means directly connecting said panels at ground level in opposed spaced relation; said cord means, when taut, marking a predetermined distance between said panels, said predetermined distance being the conventional distance measured between home plate and the pitcher's mound of conventional softball or baseball, each said panel having an unobstructed upper surface for being engaged by a practicing operator's foot, and further characterized as comprising a home plate portion and a pitcher's plate portion; whereby said connected panels enable cooperative alternate

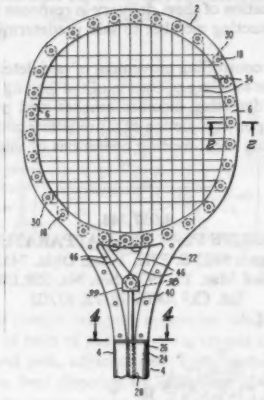


pitching and catching practice by associated players stationed thereat.

4,057,249
TENNIS RACKET

Frederick W. Reedhead, 66 Birchwood Knoll; Rowland E. Reedhead, 170 Berwyn Place, both of Trenton, N.J. 08638, and George W. Reynolds, 52 Cloverdale Circle, New Shrewsbury, N.J. 07724

Continuation-in-part of Ser. No. 524,805, Nov. 18, 1974, abandoned. This application Aug. 28, 1975, Ser. No. 608,492
Int. Cl.² A63B *51/12*
U.S. Cl. 273—73 E **7 Claims**



1. A tennis racket or the like comprising a frame including a head portion, a throat portion and a handle portion,

said frame embodying two similar members each formed of hollow material and fixedly arranged in spaced parallel planes;

pins fixedly secured to each said member for holding said members in fixed spaced relation;

sheaves rotatably mounted on said pins and located in the space between said members;

stringing for the head of the racket comprising a single endless string which is unattached to said frame, said single endless string passing only about said sheaves and being freely movable axially to equalize the tension on the stringing axially of the stringing;

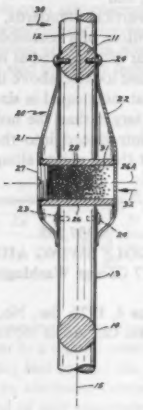
tensioning means including rotatable sheave means receiving a part of said stringing which extends into the throat area of the racket, said tensioning means extending lengthwise of the handle and throat portion of said racket; and

threaded means rotatably mounted in said handle portion and engaging said tensioning means to adjust the axial tension of said stringing.

4,057,250
TENNIS RACKET CONSTRUCTION

William G. Kuban, 5125 Ranier Pass, Columbia Heights, Minn. 55421

Filed Sept. 5, 1975, Ser. No. 610,534
Int. Cl.² A63B 49/02
U.S. Cl. 273—73 G 7 Claims



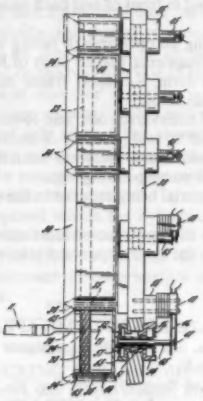
1. A sports racket having a bow portion, a handle attached to said bow portion and means providing a ball striking surface held by said bow portion, said ball striking surface generally defining a plane, a support attached to said racket adjacent the bow portion, and weight means movably retained relative to said support so as to permit substantially unrestrained movement of said weight means in direction transverse to said plane under forces generated during manual swinging of said racket to permit the weight means to physically shift when the sports racket strikes a ball, said weight means being of sufficient mass so that when the weight means shifts it effects a counteracting force reducing rebound of the sports racket after striking a ball.

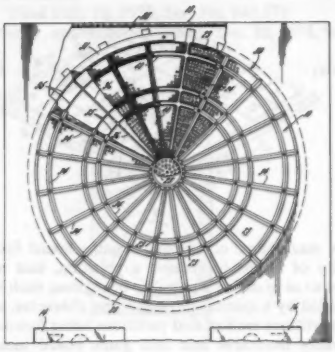
4,057,251
DART GAME WITH APERTURED TARGET PLATES RESILIENTLY MOUNTED

Richard F. Jones, Rockford, and Ernest L. Ping, Loves Park, both of Ill., assignors to Arachnid, Incorporated, Rockford, Ill.

Filed May 10, 1976, Ser. No. 685,093
Int. Cl.² A63B 65/02, 67/00, 63/00
U.S. Cl. 273—95 R 10 Claims

1. A dart game comprising the combination of (a) a dart having a slender tip and (b) a dart board which forms a target for said dart, said dart board comprising an array of target plates each having a number of closely spaced holes molded in the outer face thereof, each of said holes having a cross-sectional dimension corresponding substantially to the cross-sectional dimension of said tip whereby said tip may enter into and will remain in one of said holes when said dart is thrown at said board, a main support located inwardly of said target plates, cups telescopically receiving said target plates and slidable inwardly and outwardly relative to said support, means biasing said cups outwardly relative to said support, each of said cups having an open outer end and a closed inner end, each target plate being spaced inwardly from the open end of its respective cup, ribs located outwardly of said target plates and extending around the margins of said plates, there being one rib between adjacent margins of adjacent plates, the open ends of said cups being engageable with the inner sides of said ribs to keep the



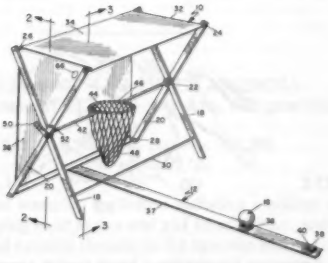


outer faces of said target plates spaced inwardly from the inner sides of said ribs.

4,057,252
BALL GAME WITH X-FRAMED BACKSTOP

Raymond Lionel Pelton, 15420 Olde Highway 80, Space 186, El Cajon, Calif. 92021

Filed May 3, 1976, Ser. No. 682,580
Int. Cl.² A63B 53/08, 63/04, 67/02
U.S. Cl. 273—101 9 Claims



1. An indoor ball game comprising:
a frame,

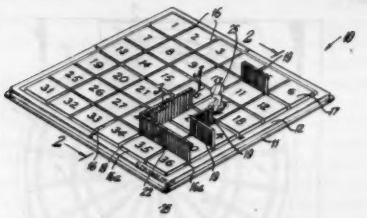
a resilient sheet material received over said frame forming substantially a planar back panel and a top panel,
said frame having a generally opened front,
a net supported in front of said back panel and under said top panel,
said net having an open mouth facing upwardly,
said frame comprising spaced pairs of legs joined near their centers to form X-shaped frame members in their deployed orientation,
a plurality of transverse rods, said X-shaped frame members being joined by said plurality of transverse rods extending between said frame members near the upper and lower ends of the corresponding legs,
said sheet material being secured to the upper forward transverse rod,
passing over the upper rearward transverse rod and being secured to the lower rearward tranverse rod.

4,057,253

MAZE BOARD GAME APPARATUS

Frank S. Csoka, Sea Cliff, N.Y., assignor to Fun Things, Inc., New York, N.Y.

Filed Sept. 17, 1976, Ser. No. 724,865
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—131 BA **15 Claims**



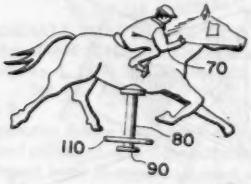
1. A maze game comprising a game board formed with a plurality of means to receive a partition, said means being formed so as to define a plurality of regions, each region being indentified by a specific distinguishing character, and a plurality of partitions each of said partitions being formed so as to be removably insertable into said game board means between adjacent regions so that the inserted partition is disposed therein, wherein a plurality of inserted partitions defines a maze on the game board, further comprising a plurality of surfaces, each surface having the pattern defining the plurality of regions as shown on the game board.

4,057,254

APPARATUS FOR PLAYING A HORSE-RACING GAME

Gerard E. Girres, Great Falls, Mont., assignor to The Raymond Lee Organization Inc., a part interest

Filed May 4, 1976, Ser. No. 683,020
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 CH **1 Claim**



1. Apparatus for playing a horse racing game comprising:
a horizontal rectangular base;
a rectangular playing surface located above the base and held parallel to it by a plurality of like vertical posts, the surface bearing printed and ruled indicia suggestive of the sport of horse racing and further bearing a plurality of slots arranged to form a concentric family of closed loops spaced equidistantly from each other in the shape of a horse racing track, each of the loops having a single circular hole therein, all of said holes being arranged in vertical alignment;
a plurality of playing pieces, each piece taking on the form of a horse and rider; and
a like plurality of vertical standards, each standard being attached to the bottom of a corresponding piece and having a small circular disc located at its lowermost end and a larger circular disc located above the small disc with the small discs being at most equal in size to the holes and the larger disc being larger than the holes so as to allow the standards to be introduced into the slots and removed therefrom only at those points along the slots where the holes are located.

4,057,255

GOLF SWING AID

Forest M. Bishop, 1217 George Washington Way No. 76, Richland, Wash. 98352

Filed June 4, 1976, Ser. No. 692,849
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—189 R **6 Claims**

1. A golf swing aid for establishing a desired condition of vertical unflexing of the wrist in the golf ball address position of a golfer, the aid comprising:
a. a glove having a front, a back and a thumb,
b. a substantial wrist band on the open end of the glove,
c. a flexible, substantially inelastic tie member connected at one of its ends to the forward end of the thumb, and having a length sufficient to extend rearward over the back of the thumb to the wrist band, and
d. connecting means on the wrist band substantially aligned with the thumb in the use position of the glove and engaging the tie member for interconnecting the forward end of the thumb and the wrist band in a selected condition of tension of the tie member for establishing a desired condition of vertical unflexing of the wrist in the address position.

4,057,256

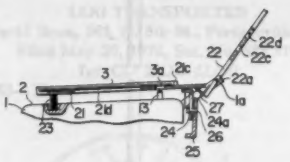
APPARATUS FOR DETACHABLY MOUNTING A RECORD SHEET IN PLACE IN A SHEET TYPE RECORDER/PLAYER

Masakazu Muranaka, Tokyo, and Saburo Kato, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed May 17, 1976, Ser. No. 686,682
Claims priority, application Japan, May 17, 1975, 50-58967
Int. Cl.[2] G11B *3/10*
U.S. Cl. 274—9 C **4 Claims**

1. A device for accurately positioning a record sheet having a plurality of positioning holes, comprising a recorder/player having a playing head movable in a predetermined path in

contact with the record sheet, a plurality of positioning pins fixed to the top of said recorder/player alignable in the positioning holes of the record sheet, a placement plate movably mounted on said recorder having a marginal edge defined thereon and having a playing head receiving opening in said marginal edge and a plurality of first positioning pin receiving apertures in the marginal edge alignable with said positioning pins, mounting means connected between said placement plate and said recorder/player to move said placement plate, a retaining plate disposable over said placement plate and pivotally mounted to said recorder/player, having a second plurality of positioning pin receiving apertures alignable with said positioning pins, wherein said pivotally mounted retaining plate is



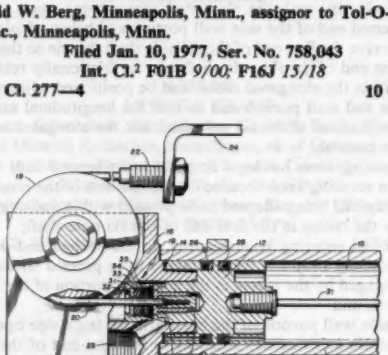
pivotable from a first position away from said placement pins of said recorder/player to a second position toward said recorder/player for engaging said second pin receiving apertures on said placement pins, an abutment connected to said retaining plate adjacent one end of said placement plate for lifting said placement plate away from said recorder/player at that end, a spring between said placement plate and said recorder/player for biasing said placement plate away from said recorder/player when said retaining plate is in said first position, alignment means on said placement plate adjacent said abutment on said retaining plate for maintaining said first pin receiving apertures in alignment with said positioning pins while said retaining plate is moved from said first position to said second position.

4,057,257

SEAL ASSEMBLY

David W. Berg, Minneapolis, Minn., assignor to Tol-O-Matic, Inc., Minneapolis, Minn.

Filed Jan. 10, 1977, Ser. No. 758,043
Int. Cl.[2] F01B *9/00*; F16J *15/18*
U.S. Cl. 277—4 **10 Claims**



1. A seal assembly for use in a cable cylinder to form an effective seal about a generally cylindrical cable, said seal assembly comprising:

a first generally disc shaped seal retaining member having a center opening extending around said generally cylindrical cable;

a second generally disc shaped seal retaining member having a center opening extending around said generally cylindrical cable;

a gland having a generally cylindrical bore extending around said generally cylindrical cable, a shoulder portion extending radially inwardly from said cylindrical bore near one end thereof for engagement by said first generally disc shaped seal retaining member and an inner groove near the other end of said cylindrical bore for engagement by said second generally disc shaped retaining member, said gland including an inner retaining lip adjacent to said inner groove and on the opposite side of said inner groove as said cylindrical bore for retaining said second disc shaped seal retaining member within said groove and one of said gland and said second disc shaped seal retaining member including means enabling said second seal retaining member to be manually urged past said inner retaining lip for seating within said groove;

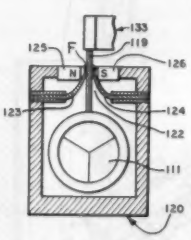
a seal member disposed within the cylindrical bore of said gland and between said first and second retaining members for forming an effective seal with the inner surface of said cylindrical bore and the outer surface of said generally cylindrical cable.

4,057,258

MEASURING ARRANGEMENT

Alfons Ernst, Traunreut, and Alfred Reichl, Trostberg, both of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Dec. 19, 1975, Ser. No. 642,471
Claims priority, application Germany, Dec. 20, 1974, 2460406
Int. Cl.[2] F16J *15/16*
U.S. Cl. 277—12 **19 Claims**



1. A measuring instrument for measuring the relative position of an object, comprising: a measuring element movable along a path; a supporting means for connecting the movable measuring element to the object whose position is to be measured; an elongated hollow body enclosing the area around the measuring element's path; an elongated slot formed in the hollow body, the slot extending along substantially the entire length of one longitudinally extending side of the hollow body, the slot being of sufficient size to permit the passage therethrough of the supporting means; flexible sealing members extending over the slot to seal the slot along its entire length and to accommodate the passage of the supporting means; and, a fluid which cooperates with the sealing members to seal the slot.

4,057,259

COLLET STOP AND CHUCK ASSEMBLY

Domingo F. Pesante, 222 S. Princeton Ave., Arlington Heights, Ill. 60005

Filed June 30, 1976, Ser. No. 701,296
Int. Cl.[2] B23B *31/20*
U.S. Cl. 279—1 S **2 Claims**

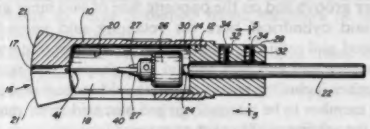
1. A stop pin assembly for collets including a hollow collet having a gripping head at one end and an axial bore, and having interior and exterior threads on the opposite end, in combination with:

a. an adapter axially bored and adapted to be removably secured to said interior threads of said collet;

b. an elongated rod having a flat surface thereon, said rod

positioned in said bore of said adapter and extending therefrom;

c. a drill chuck having expandible jaws, said chuck positioned in the interior of said collet and removably secured to one end of said rod by friction;



d. a stop pin removably secured at one end in said chuck jaws and axially aligned in said collet; and

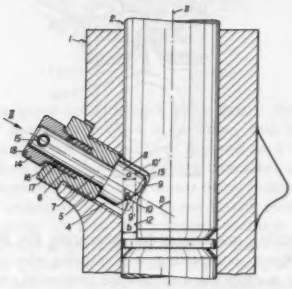
e. means in said adapter cooperating with the flat surface of said rod to adjustably position said rod longitudinally in said adapter.

4,057,260

DEVICE FOR CONNECTING THE BITS WITH THE CUTTING HEAD OF A DRIFT ADVANCING MACHINE OR THE LIKE

Siegfried Sigott, Zeltweg, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke, Vienna, Austria

Filed Jan. 22, 1976, Ser. No. 651,583
Claims priority, application Austria, Jan. 23, 1975, 506/75
Int. Cl.² B23B *31/10*
U.S. Cl. 279—77 **9 Claims**



1. A device for connecting a bit to a cutting head, comprising:

a sleeve-shaped bit holder fixed to the head and accommodating a bit, said sleeve-shaped bit holder having a cavity disposed along an axis,

a locking bolt disposed within a mounting obliquely arranged to the axis of said sleeve-shaped bit holder, said locking bolt being pivotally supported and having a recess on one side of a front end thereof protruding into the cavity of the bit holder, said locking bolt fron end extending in a locking pivotal position thereof into a recess formed in the bit,

said locking bolt also having a recessed portion defining with a front surface said front end of said locking bolt, said bit recess and said front end of said locking bolt being sized, so that when said locking bolt is moved into a releasing pivotal position, said front end of said locking bolt does not extend into said bit recess, and removal of the bit is possible, and

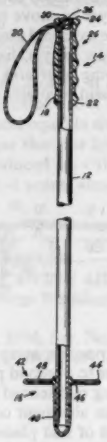
said recessed portion of said locking bolt being defined by an inclined plane extending from said fron surface of said locking bolt, and inclined plane including with the locking bolt axis an angle that is at least of the same magnitude as the angle at which the locking bolt and mounting therefor are inclined relative to the sleeve-shaped bit holder axis.

4,057,261

SKI POLE

Jeffrey M. Koblick, Hopkins, Minn., assignor to K-Tel International, Inc., Minnetonka, Minn.

Filed June 7, 1976, Ser. No. 693,354
Int. Cl.² A63C *11/22*
U.S. Cl. 280—11.37 H **4 Claims**



1. An improved hand grip and retaining strap assembly for a ski pole which includes a ski pole shaft having a generally cylindrical first end and a recess in the first end thereof, the improved hand grip and retaining strap assembly comprising:

a hand grip which includes a generally cylindrical, elongated side wall portion, having a first end and a second end, and which has a end wall portion that substantially closes the first end of the side wall portion and that has a recess therein facing the second end of the side wall portion, the end wall portion and the side wall portion defining a generally cylindrical, elongated recess within the hand grip, with the elongated recess being open at the second end of the side wall portion and being adapted to receive the first end of the ski pole shaft therein so that the first end of the ski pole shaft may be frictionally retained within the elongated recess and be positioned adjacent to the end wall portion and so that the longitudinal axes of the first end of the ski pole shaft and the elongated recess are coaxial;

a retaining strap having a first end and a second end;

a first securing knob secured on the first end of the retaining strap and being adapted to be pressed within and engaged by the recess in the first end of the ski pole shaft;

a second securing knob secured on the second end of the retaining strap and being adapted to be pressed within the engaged by the recess in the end wall portion of the hand grip; and

the side wall portion of the hand grip having a side opening therein substantially adjacent to the first end of the side wall portion, with the side opening being of such a size and shape that the composite thickness of the first and second ends of the retaining strap, including the first and second securing knobs, may be passed therethrough, from the exterior of the hand grip into the interior of the elongated recess, the improved hand grip and retaining strap when assembled being characterized by the first and second ends of the retaining strap being disposed within the elongated recess, with the retaining strap extending through the side opening with said first and second end in contact with each other, and by the first end of the ski pole shaft being disposed within the elongated recess in the hand grip so that the first end of the ski pole shaft is positioned adjacent to the end wall portion of the hand grip

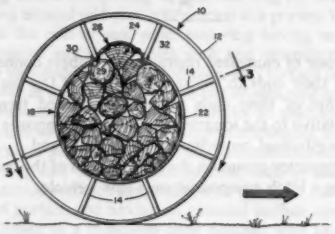
and in contact with said first and, with the first securing knob facing the first end of the ski pole shaft and being within and engaged by the recess in the first end of the ski pole shaft and with the second securing knob facing the end wall portion of the hand grip and being within and engaged by the recess in the end wall portion, said second end contacting said end wall the engagement between the first securing knob and the recess in the first end of the ski pole shaft and the engagement between the second securing knob and the recess in the end wall portion constituting the sole means of retaining the first and second ends of the retaining strap within the hand grip.

4,057,262

LOG TRANSPORTER

William David Boon, 501 W. 5th St., Portageville, Mo. 63873

Filed May 20, 1976, Ser. No. 688,319
Int. Cl.² B62D *61/00*
U.S. Cl. 280—78 **8 Claims**



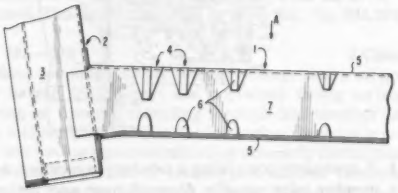
1. A transporter comprising:
a. a pair of spaced hoops,
b. a plurality of spokes interconnecting said hoops,
c. means interconnecting said spokes to form a load carrying enclosure, wherein said spokes are generally U-shaped, each of said spokes having outer end portions connected to said hoops and a central portion which defines a portion of said load carrying enclosure, and
d. load retaining means connecting at least two of said spokes to retain a load carried within said load carrying enclosure.

4,057,263

VEHICLE FRAME

Norbert Schwuchow, Sindelfingen; Gerhard Burk, Magstadt, and Dietrich Rothacker, Sindelfingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 11, 1975, Ser. No. 639,903
Claims priority, application Germany, Dec. 17, 1974, 2459519
Int. Cl.² B62D *27/04*
U.S. Cl. 280—106 R **17 Claims**



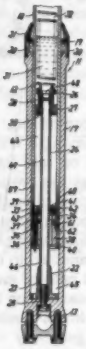
1. A vehicle frame comprising longitudinal bearers having longitudinally extending walls defining a hollow profile, said walls intersecting at longitudinally extending edges, at least one of said edges being provided with intentionally weakened portions for reducing the compressive strength in the end area of said bearers without changing the bending and torsional strengths of said bearers, and at least one member extending transversely to said bearers and interconnecting said bearers, characterized in that said weakened portions are constructed by bead means having a configuration with a portion being of greatest extent at said edges, said bead means having lateral portions of said configuration extending from said portion of greatest extent to respective walls of said bearers forming said edges, and said lateral portions joining to said walls to be in the surface of said walls.

4,057,264

FRONT FORK FOR SUSPENDING A FRONT WHEEL OF A MOTORCYCLE

Kensei Suzuki, No.10-1, Terada Tonoji, Inuyama, Aichi; Takashi Sanada, No.1511-4, Imawatari, Kani, and Kenzo Okazima, No.2637, Dota, Kani, both of Kani, Gifu, all of Japan

Filed July 25, 1975, Ser. No. 599,122
Int. Cl.² B62K *25/08*
U.S. Cl. 280—276 **3 Claims**



1. A front fork for suspending a front wheel of a motorcycle, comprising
an outer tube;
an inner tube slidable within said outer tube;
means defining adjacent an upper end of said outer tube a working-oil accumulating chamber which contains a body of oil and above the same a body of air, a lower oil chamber adjacent a lower end of said outer tube, and a pressure chamber intermediate said upper and lower chambers and becoming reduced in volume during the expansion stroke of the front fork;
passage means for providing fluid communication between said chambers, said passage means comprising a passage formed on an outer periphery of said inner tube held in sliding contact with said outer tube, a first port formed in said inner tube for providing fluid communication between said passage and said pressure chamber, a second port formed in said inner tube for providing fluid communication between said passage and an outer periphery of a lock piston disposed on a lower part of said inner tube, and orifices formed in said lock piston and communicable with said second port for providing said damping effect;
orifice means in said passage means for providing a damping effect;
means for varying the effective cross-sectional area of said orifice means for thereby adjusting said damping effect; and
means for preventing working oil which is expelled from said pressure chamber into said lower chamber during the expansion stroke of said front fork from becoming mixed with air from said layer in said upper chamber, said means for preventing working oil comprising a hollow rod fitted to a bottom wall of said outer tube and extending up-

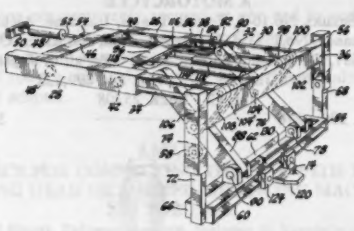
wardly into the inner tube and carrying at an upper end an auxilary piston, said auxilary piston separating said accumulating chamber from said pressure chamber, said hollow rod providing fluid communication between said accumulating chamber and said lower chamber.

4,057,265

TOWING APPARATUS

Bud W. Grace, 31480 Myrna, Livonia, Mich. 48154

Filed Nov. 24, 1976, Ser. No. 744,638
Int. Cl.² B60D *1/18*
U.S. Cl. 280—468 **9 Claims**



1. A combination comprising:
a towing vehicle having a frame, forward wheels and rear wheels mounted on said frame, said wheel means being adapted to engage the ground;
a hitching frame mounted on the vehicle so as to be movable from a forward position toward a rearward position with respect to the vehicle along a first path of motion, and first power means connected to the hitching frame for moving it along said first path of motion;
a support member carried on the hitching frame so as to be movable from a lower position toward an upper position along a linear, generally vertical path of motion, and second power means for moving the support member along said vertical path of motion, independently of the motion of the hitching frame along said first path of motion, the second power means being operative to engage the support member with the ground to raise the rear wheel means above the ground when the forward wheel means are engaged therewith; and
a hitching ball suited for coupling to a second vehicle to be towed by said towing vehicle and means mounting the hitching ball on the support member for motion therewith.

4,057,266

COUPLING GUIDE FOR TRAILER HITCHES

Lee Holmes Duncan, Box 387, Sisters, Oreg. 97759, and Lee Harold Duncan, 87749 MacKinzie Highway, Springfield, Oreg. 97477

Filed Mar. 26, 1976, Ser. No. 670,839
Int. Cl.² B60D *1/06*
U.S. Cl. 280—475 **15 Claims**

10. A coupling guide for bringing into registry a hitch component carried by a tow vehicle and a companion hitch component carried by a trailer tongue, wherein the hitch component carried by the trailer tongue is secured integrally thereto and the trailer tongue mounts an adjustable jack for supporting the forward end of a trailer, the coupling guide comprising:
a. an elongated bar mounted on the trailer tongue for longitudinal and lateral swinging movement relative to the tongue,
b. a base slidably supporting the bar for longitudinal and lateral swinging movement relative thereto, the base having an opening therethrough for the reception of said adjustable jack,
c. attaching means engaging the base for securing the latter to the trailer tongue,
d. a jack base for supporting the bottom end of the jack, the jack base including an elongated beam having elevating pads at its opposite ends for elevating the beam above the ground support.
e. a jack connector mounted on the beam for movement along the latter,
f. pivotal attachment means on the jack connector for connecting the bottom end of the jack to the jack connector,

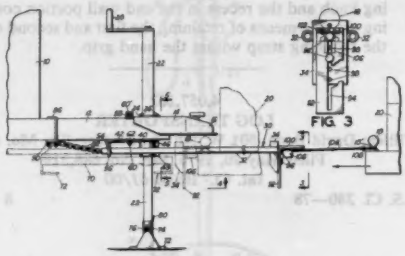


FIG. 3

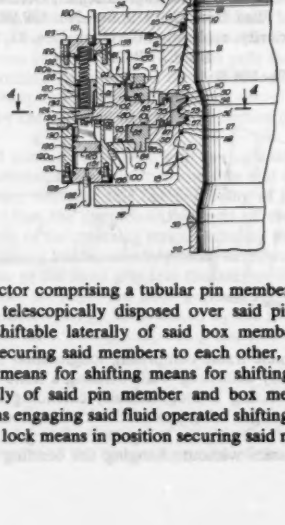
g. a pair of elongated restraining members connected at one of their ends to the rearward end of the bar and at the other of their ends to laterally spaced terminals fixed relative to the tongue and located on opposite sides of the longitudinal centerline of the tongue, and
h. connector means on the forward end of the bar for engaging a hitch component on a tow vehicle.

4,057,267

FLUID CONTROLLED PIPE CONNECTORS

Martin B. Jansen, Jr., Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Feb. 17, 1976, Ser. No. 658,417
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **18 Claims**



1. A connector comprising a tubular pin member, a tubular box member telescopically disposed over said pin member, lock means shiftable laterally of said box member and pin member for securing said members to each other, fluid operated shifting means for shifting means for shifting said lock means laterally of said pin member and box member, and separate means engaging said fluid operated shifting means for retaining said lock means in position securing said members to each other.

4,057,268

DISCONNECTABLE PIPE UNION AND DEVICE FOR MANOEUVRING SAME

Hubert Sicard, Marseilles, France, assignor to Compagnie Maritime d'Expertises - Comex, Marseilles, France

Filed Nov. 14, 1975, Ser. No. 632,156
Claims priority, application France, Nov. 18, 1974, 74.41050
Int. Cl.² F16L *21/06*
U.S. Cl. 285—31 **7 Claims**

1. A pipe union comprising an annular body for receiving and engaging a pipe end portion to which the union is to be secured, ring means comprising at least one ring for receiving and extending around said pipe end portion at a portion thereof spaced from the end of said pipe, said ring having an inner truncated conical surface co-axial with and extending at an angle to the longitudinal axis of said pipe, said surface increasing in diameter in the direction of said end of said pipe and said ring being mounted for movement parallel to said axis and toward said end of said pipe, a plurality of anchoring jaws for extending around said pipe end portion intermediate said surface of said ring and said pipe end portion, each of said jaws having an internal surface engageable with the outer surface of said pipe end portion and having an external surface conforming to the surface of a truncated cone co-axial with said pipe axis and engaging and mating with said inner surface of said ring, said jaws being movable toward said pipe axis with movement of said ring parallel to said pipe axis and toward said annular body, the engagement of said external surface of said jaws with the inner surface of said ring forcing said jaws toward said pipe axis, screw threaded means interconnecting said body and said ring means for moving said ring toward and away from said body and parallel to said pipe axis, said ring means also having at least one further truncated, conical surface facing outwardly of and co-axial with said pipe axis, said further surface increasing in diameter in the same direction as said inner conical surface of said ring, and each of said jaws also having a further surface facing toward and co-axial with said pipe axis, said last-mentioned further surface conforming to the surface of a truncated cone and being engageable and matable with said further surface of said ring means for moving said jaws away from said pipe axis with movement of said ring parallel to said pipe axis and away from said annular body.

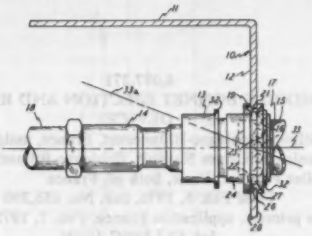
4,057,269

HOSE COUPLING RETAINER ASSEMBLY

John E. Bislew, Kansasville, Wis., assignor to J. I. Case Compny, Racine, Wis.

Continuation-in-part of Ser. No. 586,305, June 12, 1975, abandoned. This application June 9, 1976, Ser. No. 694,201
Int. Cl.² F16L *41/00*
U.S. Cl. 285—158 **2 Claims**

1. A hose coupling retainer assembly comprising a support member having spaced-apart and oppositely facing surfaces and having an opening extending through said member and between said surfaces, an elastomeric member disposed in said opening and having a groove extending exteriorly therearound and receiving the portion of said support member bordering said opening, for snap-fitting said elastomeric member snugly into said opening, said elastomeric member having spaced-apart and parallel end surfaces disposed at opposite axial ends of said elastomeric member, a hose coupling member having a uniformly cylindrical external wall, said elastomeric member having a uniformly circular central opening extending therethrough and of the diameter of said cylindrical external wall and snugly movably receiving said hose coupling member which extends through said central opening, said hose coupling member having snap ring grooves spaced apart greater than the distance of the spacing of said elastomeric member end surfaces and with said hose coupling member being free to slide back and forth in said central opening, and snap rings disposed in said snap ring grooves and extending radially into



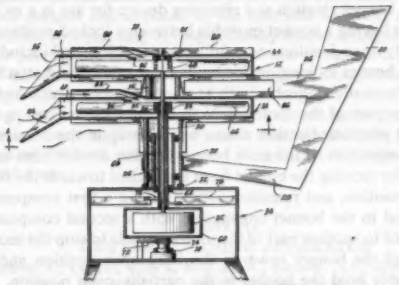
alternate and mutually exclusive abutment with said elastomeric member when said coupling member slides back and forth axially of said elastomeric member, for retaining said coupling member in said elastomeric member while permitting tipping of said coupling member relative to the axis of said central opening and under deflection of said elastomeric member.

4,057,270

FLUID TURBINE

Barry Alan Lebost, 3224 Grand Concourse, Bronx, N.Y. 10468

Filed Apr. 3, 1975, Ser. No. 565,025
Int. Cl.² F03D *1/02*
U.S. Cl. 290—54 **45 Claims**



1. A fluid turbine for generating electrical power comprising:

first rotor means including

a first housing having a fluid entrance passage,

a plurality of first rotor blades within said first housing, said rotor blades being adapted to rotate in one direction when exposed to a source of fluid,

second rotor means including

a second housing having a fluid entrance passage,

a plurality of second rotor blades within said second housing, said rotor blades being adapted to rotate in the opposite direction when exposed to a source of fluid,

means connected to said first and second rotor housings for independently rotating said housings coaxial to said first and second rotor blades in response to omni-directional fluid flow to position said fluid entrance passages in said first and second rotor housings normal to the direction of fluid flow, and

electrical means operatively connected to said first and second rotor blades for generating electrical power in response to the opposite rotation of said first and second rotor blades,

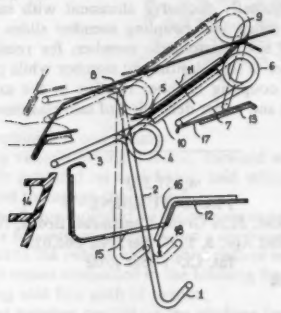
both of said first and second rotor housings including means adjacent said fluid entrance passage for increasing the velocity of the fluid flow to said rotor blades.

4,057,271

AUTOMOBILE BONNET EJECTION AND RETAINING DEVICE

André Colinet, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Feb. 5, 1976, Ser. No. 655,390
Claims priority, application France, Feb. 7, 1975, 75.03872
Int. Cl.² E05C *19/06*
U.S. Cl. 292—87 **6 Claims**



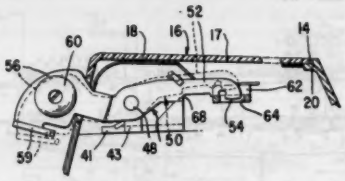
1. A bonnet ejection and retaining device for use in a motor vehicle having a bonnet movable between a locked position, a partially open position and a fully open position, and including a main bonnet locking device having one component attached to the bonnet engageable with another component attached to another part of the motor vehicle to hold the bonnet in the locked position, ejection means operable upon the release of the components of the main bonnet locking device from each other for moving the bonnet from the locked towards the fully open position, and retention means having a first component attached to the bonnet engageable with a second component attached to another part of the motor vehicle to stop the movement of the bonnet towards the fully open position and to releasably hold the bonnet in the partially open position, the improvement wherein said ejection means and one of said two components of said retention means are combined into the bonnet ejection and retaining device comprised of: a fastening member for fastening the device to the motor vehicle; an ejection spring means connected to said fastening member and operable upon the release of the components of the main bonnet locking device for moving the bonnet from the locked position towards the fully open position; and a hook assembly means having a first portion connected to said fastening member, a hook arm forming said one component of said retention means, a control lug, and a wound spring integral with said hook arm and connected to said first portion, the hook arm being free from engagement with the other of said two components of said retention means when said bonnet is in the locked position and being releasably engaged by the other of said two components during movement of the bonnet from the locked position to releasably hold the bonnet in the partially open position, the control lug being operable to release said hook arm from engagement with said other component so that the bonnet can be moved from the partially open to the fully open position.

4,057,272

ARM TOP COVER FOR LOCKING DEVICES

Erwin Vahle, Stutensee-Bl., and Helmut Tautz, Karlsruhe, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed May 4, 1976, Ser. No. 682,927
Int. Cl.² E05C *19/10*
U.S. Cl. 292—128 **4 Claims**



1. In a sewing machine having a bracket arm with a removable top cover, a top cover locking device comprising:

a. a pivot support attached within said bracket arm and located substantially beneath said removable top cover;

b. a bracket pivotally attached at its mid-point to said pivot support forming a first and a second limb, said first limb extending inside said bracket arm from said pivot support, said bracket arm being formed with a hole therein through which said second limb, extending from said pivot support, projects;

c. engaging means on said bracket arm and said top cover for assuring a proper assembled relation therebetween;

d. cooperating latch means formed on said first bracket limb and on said top cover, said cooperating latch means being arranged for interlocking engagement when said top cover occupies said assembled relation on said bracket arm; and

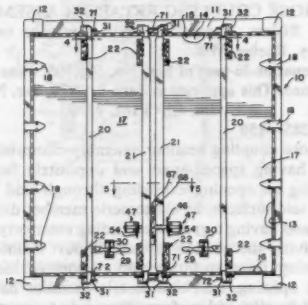
e. cooperating clip means formed in said bracket arm and on said top cover, said cooperating clip means being arranged for interlocking engagement, in concert with said cooperating latch means, when said top cover occupies said assembled relation on said bracket arm.

4,057,273

CONTAINER DOOR SECURING MECHANISM

George W. Carr, Albuquerque, N. Mex., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 24, 1975, Ser. No. 625,789
Int. Cl.² E05C *9/08*
U.S. Cl. 292—218 **17 Claims**



1. A container having a loading opening including a pair of hinged doors swingable outwardly from closed to open position relative to said opening, said doors having vertical edge portions in the closed position being disposed in substantially

contiguous relation, the improvement of a door closing and locking mechanism comprising;

a vertical locking bar for each of said doors,

hinge means having a vertical axis substantially parallel to said door coupling said locking bar and door for rotation of said locking bar about said vertical axis,

said locking bar including upper and lower locking cam means,

keeper means mounted on said container engageable by said locking cam means,

said bars each having a parallelogram wall construction and having a generally rectangular configuration in horizontal cross section and including a flat surface portion abutably engageable with said door and said vertical axis being laterally offset from said flat surface portion, said bars including an apertured wall in the closed position of said bars being disposed substantially normal to the door to which it is connected,

a slide bolt assembly on each door disposed laterally with respect to each said bar,

said assembly including a bracket,

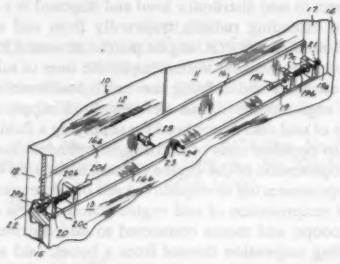
a slide bolt slideably supported on said bracket and movable into engagement with said apertured wall of an adjacent bar for locking said bar against rotation in the closed position of said door.

4,057,274

METHOD AND APPARATUS FOR BRACING AND SECURING DOORS

James J. Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Sept. 29, 1976, Ser. No. 727,400
Int. Cl.² E05C *7/04*
U.S. Cl. 292—259 R **11 Claims**



1. A door brace and security apparatus adapted for a storage area closure means comprising:

a. a storage area defined by wall and floor surfaces and having access thereto controlled by a closure means adjacent the wall and floor surfaces;

b. bracing means connected by detachable connecting means to at least one of the wall and floor surfaces within the storage area adjacent the closure means, said connecting means retaining the bracing means in position prior to locking to the closure means;

c. a retaining member having one free end and a flag member attached to the other end;

d. aperture means in the closure means through which said retaining member free end is positioned; and

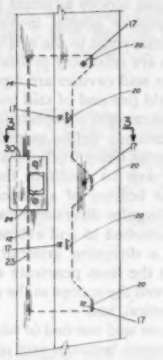
e. a locking means mounted on said bracing means for slidably engaging said retaining member free end when said free end is positioned through said closure means aperture and pushed into said locking means, and for locking to said retaining member free end when said retaining member is pulled away from said locking means, said locking means being aligned with said aperture means when said closure means is closed.

4,057,275

DOOR JAMB REINFORCING PLATE

Louis J. La Beaud, P.O. Box 50814, New Orleans, La. 70150

Filed July 28, 1976, Ser. No. 709,147
Int. Cl.² E05C *21/00*
U.S. Cl. 292—340 **5 Claims**



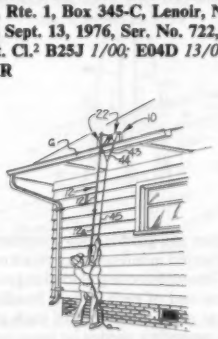
1. In combination with a doorway having wooden jambs and a door adapted to swinging inwardly and outwardly therebetween, each jamb with an oppositely disposed front and back, and one jamb defining a hollow in front for receiving a latch bolt of said door, a jamb protector for said one jamb comprising: a reinforcing plate having two contiguous sides with a common longitudinal edge defining a ninety degree angle between said sides, a first and narrower of said two sides for recessing into the back of said one jamb and outwardly, as said door swings, in said hollow and the second and wider of said two sides, defining a plurality of fastening holes, for placing against the the back of said one jamb; a third and discontinuous side parallel and opposite to the first and narrower side and defined by a plurality of longitudinally spaced triangular points for penetrating into the back of said one jamb; and a plurality of individual fastenings adapted to engage through said fastening holes into the back of said one jamb, whereby the reinforcing plate is fixed to the back of said one jamb against separation therefrom in all directions by each side and strengths the jamb against splitting, splintering and kick-outs in attempts to force said door.

4,057,276

GUTTER CLEANING APPARATUS

Grover C. Currie, Rte. 1, Box 345-C, Lenoir, N.C. 28645

Filed Sept. 13, 1976, Ser. No. 722,803
Int. Cl.² B25J *1/00*; E04D *13/06*
U.S. Cl. 294—19 R **10 Claims**



1. An apparatus for remotely removing accumulated leaves and other debris from an overhead gutter of a building or the like, and comprising

an elongate pole having one end adapted to be held by a

workman and an opposite end adapted to reach above an overhead gutter or the like,

a pair of cooperating scoops, with each of said scoops having a pair of side walls and a bottom wall to define a relatively large internal cavity adapted to receive a substantial quantity of debris therein,

means mounting said scoops adjacent said opposite end of said pole for relative pivotal movement about an axis which extends transverse to the axis of said pole and such that said scoops are relatively pivotable between an open position wherein said cavities are separated and face generally toward said one end of said pole and a closed position wherein said cavities are substantially face to face and the scoops collectively define an enclosure of substantial volume, said scoops being freely rotatable in unison about said transverse axis to facilitate the alignment of said scoops with the bottom of a gutter when said pole is extended in an angular direction relative to the gutter,

at least one tine attached to and extending forwardly from each scoop in a direction generally toward the other scoop such that the tines penetrate and grasp any debris positioned between the scoops as the scoops are pivoted to their closed position, and

means operable from said one end of said pole for selectively pivoting said scoops between said open and closed positions,

whereby a workman may lower the scoops into an overhead gutter with the scoops in said open position and then pivot the same to said closed position to collect a substantial quantity of debris within said enclosure.

4,057,277

YARD AND GARDEN TOOL

Marie L. Burkholder, 806 Devonshire Terrace, Hampton, Va. 23666

Filed Nov. 24, 1976, Ser. No. 744,791
Int. Cl.² A01B 1/18
U.S. Cl. 294—50.8 **9 Claims**

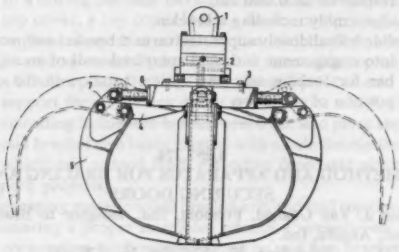
1. A weed puller and garden tool comprising a pair of elongated handles oriented in intersecting relation, means pivotally and detachably interconnecting said elongated handles, handgrip means at one end of each of said handles and detachable connecting means at the other end of each of said handles for interchangeably mounting garden or lawn care tools or implements thereto to facilitate use of the handles when pivotally interconnected and when separated from each other, said means pivotally and detachably connecting the handles including a projecting stud rigid with one of the handles and received through an opening in the other of the handles, said stud including a peripheral groove adjacent the free end thereof, the other of the handles including a movable lock plate slidably mounted thereon with one end of the lock plate including a notch received in the peripheral groove in the stud for locking the handles together with the notch in the lock plate moving peripherally in the groove during pivotal movement of the handles, spring means biasing the lock plate to locking position, and handle means on the lock plate to retract the lock plate to a released position to enable the stud to be removed from the opening thereby detaching the handles.

4,057,278

MULTI-SHELL GRAB BUCKET

Heinrich Götzen, Wetter, Germany, assignor to Heinrich Götzen Maschinenbau, Germany

Filed June 4, 1976, Ser. No. 692,727
Claims priority, application Germany, June 6, 1975, 2525152
Int. Cl.² B66C 3/16
U.S. Cl. 294—88 **9 Claims**



1. In a multi-shell grab bucket apparatus: a distributor head having a plurality of engine cylinder chambers rigidly fixed with respect to said distributor head and disposed in a common plane and extending radially outwardly from and angularly spaced about a center axis, engine pistons mounted for sliding reciprocatory movement within respective ones of said engine cylinder chamber and defining therewith double-acting reciprocating engines, and means defining fluid supply passages internally of said distributor head for supplying a fluid pressure medium to opposite ends of said engine cylinder chambers to effect reciprocation of the engine pistons; a plurality of actuatable scoops connected to respective ones of said engine pistons such that reciprocation of said engine pistons effects actuation of said scoops; and means connected to said distributor head for enabling suspension thereof from a boom, said means for enabling suspension of said distributor head including means connectable to an external source of fluid pressure medium for supplying the medium to said fluid supply passages located internally of said distributor head to effect actuation of said scoops.

4,057,279

CENTER LIFTING DEVICE

Timo Pykälä, Espoo, Finland, assignor to Oy Finnlines Ltd., Helsinki, Finland

Filed Sept. 17, 1976, Ser. No. 724,250
Claims priority, application Finland, Sept. 29, 1975, 752712
Int. Cl.² B66C 1/46
U.S. Cl. 294—93 **10 Claims**

1. A center lifting device for lifting and transferring rolls of material, such as papers rolls and the like having a hollow opening formed therein, comprising inner and outer parts arranged with said inner part located within said outer part and being movable inside the outer part over a limited distance in relation to each other, said outer part being adapted to be fitted partly into the hollow opening in the material roll to be lifted, said inner part having an upper end including means for attaching the inner part to be a lifting device, said outer part having

a lower end including expandable and contractable means for selective gripping and releasing engagement with said hollow opening in response to relative movement of the parts and an upper end including means for selectively preventing said inner part from rising in relation to said outer part; a driving member, means for resiliently mounting said driving member on the upper end of said outer part for axial movement between upper and lower positions with respect to said upper end

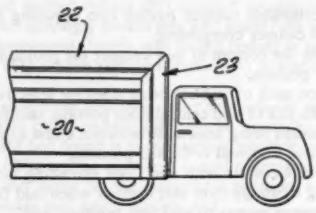
of the outer part and including means cooperating with said preventing means for releasing the preventing means when the driving member is forced downwards to permit said inner part to rise with respect to said outer part; and releasable locking means for retaining said driving member at its lower position adjacent the upper end of the outer part and cooperating with said inner part to release the lock means from the driving member when the inner part moves upwards in relation to the outer part at the initial stage of a lift.

4,057,280

AERODYNAMIC DRAG REDUCTION DEVICES FOR SURFACE VEHICLES

Paul B. MacCready, Jr., and Peter B. S. Lissaman, both of Pasadena, Calif., assignors to AeroVironment Inc., Pasadena, Calif.

Division of Ser. No. 503,290, Sept. 5, 1974, Pat. No. 3,934,922. This application Nov. 6, 1975, Ser. No. 629,366
Int. Cl.² B62D *35/00*
U.S. Cl. 296—1 S **3 Claims**



1. In combination with a truck that includes a cab having a roof, and a box-like body elongated rearwardly of the cab, the body having an exterior front wall facing forwardly toward the cab, said front wall extending downwardly substantially below the level of the cab roof, the body also having laterally opposite exterior side walls, and an exterior top wall, each side wall meeting said top wall at a rearwardly elongated corner, the improvement that comprises,

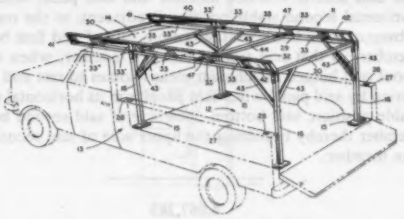
a. an elongated protrusion extending adjacent and along one of said corners in enveloping relation therewith, said protrusion having two rearwardly elongated edge portions respectively attached to said body exterior side wall and top wall, said protrusion having a rearwardly elongated mid-portion which is outwardly convex and which protrudes laterally throughout the major length of the protrusion.

4,057,281

CARRYING RACK FOR TRUCKS

Luther J. Garrett, 8345 S. 84th Court, Hickory Hills, Ill. 60457

Filed Apr. 7, 1976, Ser. No. 674,374
Int. Cl.² B60D *3/00*
U.S. Cl. 296—3 **7 Claims**



1. A detachable and foldable rack to facilitate carrying material above a bed and a cab of a truck comprising:

a plurality of legs;

a support pad for each leg, said pad adapted to be permanently and rigidly attached to the bed of the truck;

detachable securing means to detachably secure said legs to said support pads;

a rectangular frame including longitudinally extending side rails and transversely extending crossbars including a rear section overlying the bed of said truck and a front section overlying the cab of said truck;

a pair of top rails overlying said side rails and said frame;

support members disposed between said side rails and said top rails;

bracing means diagonally extending between each leg and said frame, said bracing means being detachably secured at an end thereof;

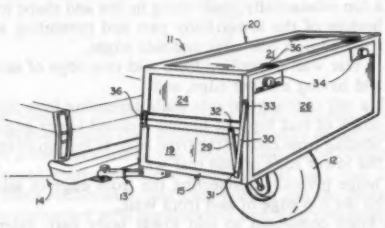
bracket means pivotably connecting said legs to said frame allowing said legs to be folded against said frame whenever the legs are detached from said support pads, and at least an end of said bracing means is also detached.

4,057,282

VEHICLE TRAILER

Kenneth B. Kidd, 3722 W. Peoria, Phoenix, Ariz. 85029

Filed Apr. 14, 1976, Ser. No. 676,729
Int. Cl.² B60P *3/34*
U.S. Cl. 296—10 **5 Claims**



1. A vehicle trailer comprising: a base structure comprising wheel means and attachment means constructed and arranged for attaching said trailer to the rear of a vehicle; mounted atop said wheel means, a first box-like member having four sides and being open at its top and rear; attached to said first box-like member and having a first stable position atop said first box-like member, a second box-like member having four sides and being open at its bottom and rear; hinged attachment means

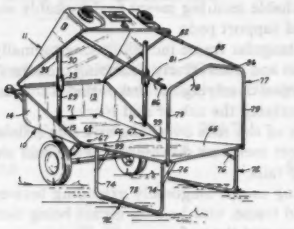
between said box-like members between the upper rear corners of said first box-like member and the lower rear corners of said second box-like member; a panel hingedly attached to the lower rear of said first box-like member and attached by a hinged arm member to said first box-like member, said hinged arm member being positioned between a first pin in said first box-like member located adjacent to said hinged attachment means and a second pin in said panel; so constructed and arranged that said panel when in an upright first stable position closes the rear open sides of both said first box-like member and said second box-like member and said panel when in a horizontal second stable position is adjacent, to the rear, and substantially in line with the bottom side of said first box-like member, so that said second box-like member, when rotated about said hinged attachment means comes to rest and is supported by said panel when said panel is in its horizontal second stable position, said bottom open side of said second box-like member thereby becoming the upper side of said second box-like member.

4,057,283

MOTORCYCLE TRAILER

David L. Barnett, Phoenix, Ariz., assignor to Robert L. Howard, Phoenix, Ariz.

Filed June 26, 1975, Ser. No. 590,446
Int. Cl.[2] B60P *3/34*
U.S. Cl. 296—23 C **9 Claims**



1. In a motorcycle trailer,

a. a lower body part comprising:

I. a bottom defined by a free rear edge, a front edge and side edges,

II. a front wall upstanding from said front edge and presenting a top edge, and

III. a pair of triangular side walls upstanding from said side edges and presenting inclined top edges extending from ends of the top edge of said front wall to ends of said rear edge of the bottom;

b. an upper body part comprising:

I. a top substantially conforming in size and shape to said bottom of the lower body part and presenting a free front edge, a rear edge and side edges,

II. a rear wall depending from said rear edge of said top and having a lower edge, and

III. a pair of triangular side walls depending from the side edges of said top and having inclined lower edges extending from ends of the front edge of the top to ends of the lower edge of said rear wall;

c. a hinge pivotally connecting the front edge of said top with the top edge of said front wall;

d. a hitch connected to said lower body part, extending forwardly therefrom, and including means for connecting the hitch to a motorcycle;

e. a wheel suspension secured to the bottom of said lower body part and including a pair of wheels and spring means interposed between said wheels and said bottom;

f. means for supporting said holding said upper body part in open relation to said lower body part in which said bottom and said top are disposed at an acute angle relative to each other;

g. a bed part of substantially the same size and shape of said bottom as defined by front, rear, and side edges;

h. a hinge connection between the rear edge of said bottom and the front edge of said bed part, said hinge providing for swinging movement of said bed part into a horizontal position in which it aligns with said bottom;

i. collapsible means attached to said bed part for supporting the bed part in said horizontal position;

j. a frame pivotally mounted on said bed part at the rear edge thereof, said frame of U shape comprising a cross-bar in the form of a wide V with legs extending from the ends of said cross-bar to pivotal connections therefor at the rear edges of said bed part;

k. means for supporting said frame from said upper body part when the latter is in said open position, said means comprising a pair of telescoping arms with each arm including an outer tube having one end pivoted to a side wall of the upper body part on the inner face thereof, an inner member slidable in said tubular member and having means at its outer end for detachably connecting it to said frame at the end of the cross-bar of the frame, and a spring clasp on the inner face of each of said side walls receiving said outer tubular members when the telescoping arm thereat is collapsed; and

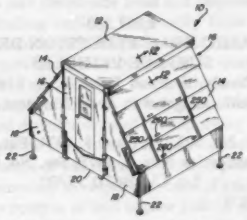
l. a canopy held in effective position by said body parts, said frame and the supporting means for the frame.

4,057,284

COLLAPSIBLE CAMPER

Paul Clifford Blank, Del Camino Place Rte. 4, Space 103, Longmont, Colo. 80501

Filed May 3, 1976, Ser. No. 682,642
Int. Cl.[2] B60P *3/34*
U.S. Cl. 296—23 F **9 Claims**



1. A collapsible camper having two opposing longitudinal sides, said camper comprising:

means in the bottom of said camper for providing a central floor portion,

means on each of said opposing sides for selectively extending the size of said central floor portion, said floor extending means being selectable between a first expanded position and a second collapsed position,

means cooperative with said floor extending means for uplifting a canopy over said camper when said floor extending means moves to said first position, and

means on each of said opposing sides of said central floor portion and cooperative with said floor extending means for forming side walls between said floor extending means and said uplifted canopy, each of said side wall forming means including a plurality of sliding panels, means attached to each of said panels for guiding the sliding movement of each panel relative to an adjacent panel, and, means attached to each of said panels for limiting the sliding movement of each panel relative to an adjacent panel, each of said side wall forming means further including means for mounting one of said sliding panels to a respective one of said floor extending means and means for removeably attaching a second of said sliding panels adjacent to said uplifted canopy whereby said second

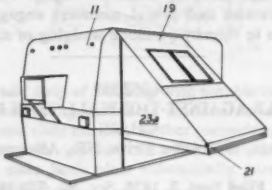
sliding panel can be moved away from said floor extending means toward said uplifted canopy and attached adjacent thereto to slide said plurality of sliding panels relative to each other to form one of said side walls and said second sliding panel can be removed from attachment adjacent said uplifted canopy and moved toward said floor extending means to slide said plurality of sliding panels relative to each other to collapse said side wall.

4,057,285

COLLAPSIBLE FOLDING BEDS FOR VEHICLES

Charles Bemos, 1213 Green St., N., New Port Richey, Fla. 33552

Filed July 30, 1976, Ser. No. 710,293
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—23 H **1 Claim**



1. In a vehicle (11) with a top (13) and a vertical side (18), a wall-mounted extendable bed arrangement comprising in combination:

a. a rectangular aperture defined in said side with two opposed inner edges having first and second vertical guide rails (37) towards each of said inner edges, an upper roller holding station (41) defined at about the center of said rail arrangement, a lower holding station (43) at the bottom of said rail arrangement;

b. a rectangular flat side wall (19) pivoted to the vehicle top (13), and normally forming a flat flush outer surface with the vehicle side (18), the bottom of said side wall extending outwards when the said side wall is outwardly pivoted;

c. a rectangular bed frame (21) with longitudinal bed frame sides, having an inner section (29) designed to be disposed towards the inside of the vehicle and an outer section (39) desinged to extend out of the vehicle, said inner section being slightly tapered, said bed frame (21) being normally vertically disposed with the taper of said inner section extending upwards;

d. first and second rollers (35) coupled to said bed frame sides, and movingly locked into said guide rails for up and down movement therein said rollers resting at said upper station (41) where said bed frame (21) is vertically disposed;

e. a defined storage area (45) under said vehicle where said bed frame outer section (39) can be normally received when said bed frame is in the vertical position, said outer section (39) pivoting outwards as said rollers travel downwards and being in the horizontal position when said rollers enter said lower station; and

f. foldable side panels (23*a*, 23*b*) of triangular shape attached to the sides of said frame, said side panels folding over the bed in collapsed position and sealing the vehicle when the bed is used.

4,057,286

RETAINING MEMBER FOR VEHICLE CHASSIS

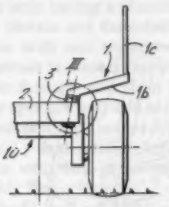
Kunto Elonen, Tampere, Finland, assignor to Rauma-Repola Oy, Finland

Filed Nov. 26, 1975, Ser. No. 635,430
Int. Cl.[2] B60P *7/06*
U.S. Cl. 296—43 **4 Claims**

1. In a vehicle adapted to transport a commodity and having means for retaining the commodity on the chassis of the vehicle, the improvement comprising:

a. a bearing mounted on said chassis, said bearing having a longitudinal axis tilted upwardly and outwardly with respect to a line perpendicular to said chassis, and

b. a rigid retaining member having a first portion thereof rotatably journalled in said bearing, a second portion extending generally horizontally outward from said journalled first portion, and a third portion extending generally vertically upward from said second portion, the longitudinal axis of said bearing being tilted sufficiently from the perpendicular to the chassis and the three portions of said retaining member being joined to each other at such respective angles that, when said retaining member is permitted to rotate under the influence of gravity, said second portion assumes an upward and outward extension away from the chassis and said third portion assumes a position generally perpendicular to the chassis.

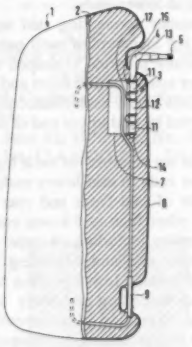


4,057,287

SUN SHADE FOR MOTOR VEHICLE

Harry L. Lilja, Solhem 5102, S-443 00 Lerum, Sweden

Filed June 23, 1976, Ser. No. 698,873
Claims priority, application Sweden, June 25, 1975, 7507284
Int. Cl.[2] B60J *3/00*
U.S. Cl. 296—97 K **4 Claims**



1. A sunshade intended for use in motor vehicles, comprising: a light-shielding unit, a hinge for pivotally suspending said unit in a fixed portion of the vehicle, said hinge comprisng a rod-shaped shaft part and a sleeve-shaped part, one of said parts being anchored to said fixed portion and the other being rigidly connected with the shielding unit, said two parts being pivotally connected to each other with a suitably chosen friction, said sleeve-shaped part having at least two sleeve portions, an anchoring plate connecting said sleeve portions to each other at a distance from the pivoting axis of the hinge, at least one of the sleeve portions being biased relative to the other of the sleeve portions by a bias force so that said one sleeve portion tends to take a radially displaced position relative to the pivoting axis of the hinge, said anchoring plate having a recess between the sleeve portions extending a prede-

termined distance from said pivoting axis, said distance determining the moment arm of said bias force.

4,057,288
STACKABLE WHEELED CHAIR

Robert T. Schwartz, Takoma Park, Md., and Marc S. Harrison, Foster, R.I., assignors to American National Red Cross, Washington, D.C.

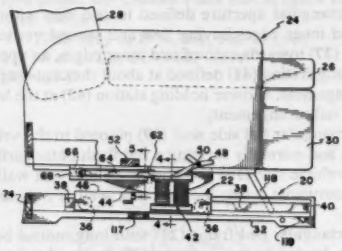
Filed Nov. 9, 1976, Ser. No. 739,860
Int. Cl.[2] A47C *3/04*
U.S. Cl. 297—239 **6 Claims**

1. A stackable wheeled chair comprising:
seat means;
supporting frame means carrying said seat means;
said frame means including:
a pair of laterally spaced generally inverted U-shaped leg means, and
transversely extending stringer means having laterally spaced ends secured respectively to said leg means, said seat means being carried by said stringer means intermediate said ends;
said leg means each comprising:
a front and a rear normally upstanding leg member each having upper and lower ends,
a connecting member connecting said upper ends of said front and rear leg members of each pair to each other to form said generally inverted U-shaped leg means;
a stacking member spanning said front and rear leg members in each leg means below said connecting member, and
caster means carried by said lower end of each front and rear leg member;
said front and rear leg members of each leg means diverging from said upper ends to said lower ends thereof whereby said upper ends of said front and rear leg members are closer to each other than said lower ends;
said front leg member including an upper portion terminating in said upper end and extending downwardly and forwardly therefrom, a lower portion terminating in said lower end and extending generally vertically, and an intermediate flared portion interconnecting said upper and lower portions and extending downwardly and forwardly at a greater angle to the vertical than said upper portion,
each rear leg member including an upper portion terminating in said upper end and extending downwardly and rearwardly therefrom, a lower portion terminating in said lower end and extending generally vertically, and an intermediate flared portion extending downwardly and rearwardly at a greater angle to the vertical than said upper portion,
said caster means each including a caster member comprising a wheel member, a generally horizontally extending axle rotatably supporting said wheel member, an offset wheel support member carrying said axle and including a generally vertically extending pin, said pin being rotatably supported about a generally vertically extending axis in said lower end portion of its respective leg member;
each of said stacking members comprising a generally horizontally extending portion adapted to rest on the upper surface of a connecting member of the next lower chair in a stack and a generally vertically extending portion adapted to engage against the outer side surface of a connecting member of the next lower chair in a stack to provide side-to-side security to a stack of chairs, and
each of said wheel members being adapted to engage against the upper surface of said flaring portion of a leg member of the next lower chair in a stack when the front and rear offset supports extend fowardly and rearwardly, respectively, to provide front-to-back security to a stack of chairs;
said leg means, connecting member, stacking members, flaring portions, and wheel members being so arranged and constructed that contact between leg means of stacked chairs substantially only occurs at the points at which said stacking members engage said connecting members and said wheel members engage said flaring portions to thereby preclude wedging of stacked chairs.

4,057,289
ROCKABLE AGAINST-THE-WALL TYPE RECLINING CHAIR

W. Dale Jones, 7020 Aztec Drive, NE., Albuquerque, N. Mex. 87110

Filed Sept. 3, 1976, Ser. No. 720,244
Int. Cl.[2] A47C *3/02*
U.S. Cl. 297—259 **11 Claims**



1. An against-the-wall type rackable reclining chair comprising a stationary base, carriage means mounted on said base for forward and rearward movement relative to said base between forward and rearward end limits of movement, a chair frame mounted upon said carriage means for rocking movement, a chair seat, a chair back, reclining linkage means mounting said chair seat and said chair back upon said chair frame for coordinated movement relative to said chair frame between an upright and a reclined position, and means permitting rocking movement of said chair frame on said carriage means only when said carriage is adjacent its forward end limit of movement relative to said base.

4,057,290
VEHICLE OCCUPANT RESTRAINING BELT ARRANGEMENT

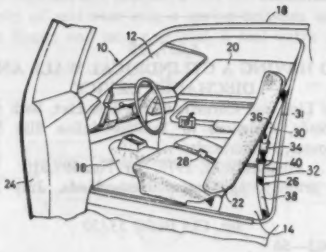
Tatsuhiro Arima, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 27, 1976, Ser. No. 709,215
Claims priority, application Japan, Sept. 8, 1975, 50-123700[U]
Int. Cl.[2] A44B *11/12*
U.S. Cl. 297—389 **4 Claims**

1. In a vehicle occupant restraining belt arrangement:
a strip of webbing;
a male latch plate adapted to be inserted within a female buckle, said male latch plate having an opening through which said strip of webbing is slidably disposed, said male

latch plate having one end formed with said opening and an opposite end;

means for limiting movement of said male latch plate in one direction along said strip of webbing beyond a predetermined position on said strip of webbing, said limiting means comprising a slide member having an eye means for



receiving said strip of webbing with suitable resistance for slidably positioning said slide member on said strip of webbing, said slide member further comprising slot means for receiving the opposite end of said male latch plate to hold said male latch plate substantially parallel to said strip of webbing.

4,057,291

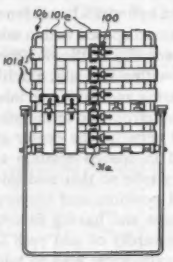
REMOVABLE COVER FOR OUTDOOR-TYPE CHAIRS

Emanuel Dubinsky, 99 Kingston Ave., Yonkers, N.Y. 10701

Continuation-in-part of Ser. No. 538,455, Jan. 3, 1975, Pat. No. 4,010,980. This application July 15, 1976, Ser. No. 705,611

Int. Cl.[2] A47C *4/30*

U.S. Cl. 297—441 **5 Claims**



1. A removable cover for a chair having a frame having a seat portion and a back portion, said cover comprising a first plurality of straps extendable about said frame, each of said straps having separable and lockably interconnectable first and second corresponding ends having through apertures therein and a tension adjusting means insertable through and cooperable with said first and second corresponding end apertures for lockably interconnecting said strap about said frame at a desired tension level, said first corresponding end of each of said first plurality of straps comprising a plurality of said through apertures longitudinally spaced apart along the length of said strap by a predetermined distance therebetween and an adjustable slide buckle means having a plurality of spaced apart cross bar members through which said first corresponding end of said strap is adjustably and lockably threadable for varying the longitudinal length of said strap, said second corresponding end of each of said first plurality of straps comprising at least one through aperture and a reinforcement bar means adjacent said one aperture capable of substantially evenly distributing tension applied thereto for providing tension bearing support for said one aperture, one of said plurality of apertures in said first corresponding end being positionable adjacent said cross bar member closest to the adjusted end length of said strap for each variable length of said strap, said closest cross bar member adjacent said positionable one aperture being further capable of substantially evenly distributing tension applied thereto for providing tension bearing support for said positionable one aperture for enabling said slide buckle means to provide both strap size adjustability and tension bearing support for said positionable one aperture, said tension adjusting means comprising a buckle-type closure larger in size than said strap apertures and having an aperture therein with a pawl-like means extending into said closure aperture and a longitudinally serrated ratchet-type strip having a plurality of longitudinally extending serrations therein and extendable into said buckle-type closure aperture with said serrations being engageable with said pawl-like means in ratchet fashion, said ratchet-type strip being insertable through said strap first corresponding end positionable one aperture and said second corresponding end one aperture and said buckle-type closure aperture and interlockable therein by said ratchet fashion engagement of said pawl-like means with said serrations for adjusting the tension of said lockably interconnected straps and holding said tension at a desired level, said pawl-like means being sequentially engageable with said longitudinal serrations during said adjustment of said strap tension, said interlockable ratchet-type strap bearing on tension against said reinforcement bar and said slide buckle means closest cross bar member both during adjustment of said tension and during holding of said tension at said desired level, whereby the tension applied to said first corresponding end positionable one aperture and said second corresponding end one aperture is substantially evenly distributed between said strap first and second corresponding ends, said first plurality of straps being extendable substantially parallel to each other with spaces between adjacent straps when said straps are extended about said frame, and a second plurality of straps extendable about said frame over some of said first plurality of straps and under some other of said first plurality of straps in a woven-like configuration, said first and second plurality of straps being cooperable in said woven-like configuration in a position for covering said back and seat of said chair.

4,057,292

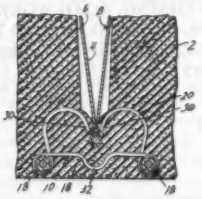
TRIM RETAINER DEVICE FOR UPHOLSTERED CUSHIONS

Harmon W. Arnold, Carthage, Mo., assignor to Flex-O-Lators, Inc., Carthage, Mo.

Filed June 11, 1976, Ser. No. 695,087

Int. Cl.[2] A47C *7/02, 7/18*

U.S. Cl. 297—452 **10 Claims**



1. In combination with an upholstered seat assembly including a pliable trim sheet assembly covering a foam seat cushion pad of said seat assembly, said pad having a deep groove formed in the top surface thereof along a line thereof along which said trim sheet assembly is to be secured thereto, and said trim sheet assembly having a listing portion extending along said line and depending into said groove, a retainer assembly for securing said trim sheet assembly to said pad, said retainer assembly comprising:

a. an elongated support structure molded in said pad generally along the base of said groove, and

b. a series of pairs of resilient claw teeth mounted on said support structure in spaced relation along the length thereof, the teeth of each of said pairs being laterally spaced relative to said groove and meeting substantially at the longitudinal midline thereof, whereby when said listing portion of said trim sheet assembly is pressed into said groove and between said pairs of teeth, it forces the teeth of each of said pairs of teeth resiliently apart, whereupon the elastic recovery of said teeth causes the points of said teeth to engage and retain said trim sheet listing therebetween.

4,057,293

PROCESS FOR IN SITU CONVERSION OF COAL OR THE LIKE INTO OIL AND GAS

Donald E. Garrett, 505 W. 9th St., Claremont, Calif. 91711

Filed July 12, 1976, Ser. No. 704,236
Int. Cl.² E21C *41/00*
U.S. Cl. 299—2 **15 Claims**

1. A process for the in situ gasification of coal, or similar hydrocarbon solid, by means of a reversing cycle oxygen-steam system, the process comprising the steps of:

a. forming at least one retorting room in a coal deposit by segregating an area from surrounding areas by means of substantially impervious walls to prevent substantial gas leakage from said retorting room, said retorting room having a roof defined by the coal deposit and further having a gas inlet passage and a gas outlet passage;

b. blasting within said retorting room to effect at least a partial roof collapse to form a substantially homogeneous, porous rubblized coal mass in said retorting room;

c. introducing oxygen-containing gas in said gas inlet passage of the retorting room and initiating and conducting pyrolysis of the coal mass at a temperature of between about 900° and about 2500° F.;

d. withdrawing oil and gas products from the pyrolysis through said gas outlet passage of the retorting room;

e. after substantial completion of the pyrolysis conducted in step (c) and product withdrawal from step (d), reversing the direction of gas flow through the retorting room by introducing steam into said gas outlet passage thereby to effect a water-gas reaction with residual carbon in said retorting room to produce a relatively high BTU gas product and

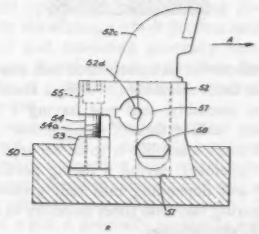
f. withdrawing said relatively high BTU gas product from the water-gas reaction through said gas inlet passage of the retorting room.

4,057,294

WEDGE ARRANGEMENT FOR REMOVABLY AFFIXING A WORK TOOL OR WORK TOOL HOLDER TO A BASE MEMBER ON MINING, ROAD WORKING OR EARTH MOVING MACHINERY, AND THE LIKE

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Company, Cincinnati, Ohio

Filed Aug. 1, 1975, Ser. No. 601,035
Int. Cl.² E21C *13/00*
U.S. Cl. 299—93 **71 Claims**



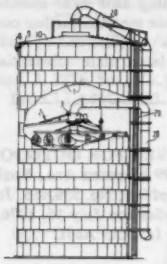
1. In mining, road working and earth moving machinery a wedging arrangement for removably affixing a work tool holder to a base member, said arrangement comprising: one of said base member and said work tool holder having a slot therein, the other of said base member and said work tool holder being received in said slot; a wedge element in said slot; and holding means to hold said wedge element in said slot in wedging engagement with both of said work tool holder and said base member.

4,057,295

SILO HAVING A CYLINDRICAL WALL AND A DISCHARGE DEVICE

Fredericus Liet, and Cornelis Hendrikus Liet, both of Losser, Netherlands, assignors to Trioliet-Mullos Silo Nederland B.V., Losser, Netherlands

Filed July 21, 1975, Ser. No. 597,510
Claims priority, application Netherlands, July 22, 1974, 7409901
Int. Cl.² B65G *53/50*
U.S. Cl. 302—56 **4 Claims**



1. In a silo having a cylindrical wall for containing material such as ensilage, a frame disposed within said silo and including a bearing disposed centrally of the silo, means for raising and lowering said frame within said silo, a delivery tube rotatably journalled in said bearing and having an inlet section extending radially outwardly therefrom and terminating in an inlet mouth at a position located between the center of said silo and said cylindrical wall and in spaced relation to both, means for rotating said delivery tube so that said inlet mouth follows a circular path at said position, and conveying means rotated with said delivery tube and having first conveying elements disposed radially outwardly of said path for feeding ensilage inwardly from said cylindrical wall to said path followed by said inlet mouth and second conveying elements disposed radially inwardly of said path for feeding ensilage outwardly from the center of the silo to said path followed by said inlet mouth, said conveying means comprising a plurality of radially extending and circumferentially spaced arms, said first and second conveying elements being formed as wheels connected to said arms, and rigid rake elements depending from said arms and projecting below said wheels, said rake elements being movable to positions in which they do not project below said wheels.

4,057,296

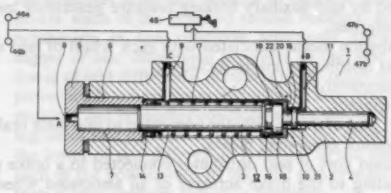
BRAKE CONTROL VALVE ASSEMBLY FOR EFFECTING INCREASED REAR BRAKING ACTION UPON MALFUNCTION OF THE FRONT SYSTEM

Hiroyuki Oka, and Masashi Ishihara, both of Toyodashi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Sept. 13, 1976, Ser. No. 722,501
Claims priority, application Japan, Sept. 17, 1975, 50-112422
Int. Cl.² B60T *8/26*
U.S. Cl. 303—6 C **9 Claims**

1. A brake control valve assembly comprising a cylinder

defined by a cylinder casing; a first pressurized brake fluid feed port formed in said cylinder casing for communication with a rear master cylinder; a first pressurized brake fluid discharge port in said cylinder casing for communication with at least one rear wheel cylinder; a piston having a rear end and a front end fitted within said cylinder, said piston being provided between its said ends with a head flange and a spring-receiving flange spaced from one another; a rear seal about said piston in the vicinity of said rear end; a spring between said spring-receiving flange and said rear seal; a seal valve interposed



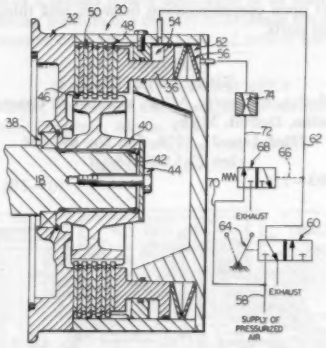
about said piston between said head flange and said spring-receiving flange; a carrying flange formed on said piston and spaced from said head flange of said piston towards its said front end; and a piston sleeve disposed loosely about and between said head flange and said carrying flange, said brake fluid feed port being in fluid communication with space within said cylinder casing between said front end of said piston and said carrying flange and said fluid discharge port being in fluid communication with space within said cylinder casing between said spring-receiving flange and said rear seal.

4,057,297

BRAKE MECHANISM WITH SPRING APPLIED FLUID PRESSURE RELEASED ASSEMBLY

Henry E. Beck, Oswego, and Terry R. Collins, Lewistown, both of Ill.

Filed June 28, 1976, Ser. No. 700,242
Int. Cl.² B60T *13/22*
U.S. Cl. 303—71 **1 Claim**



1. A brake mechanism comprising:

a body;

a piston movable relative to the body in a first braking direction and in a second brake-releasing direction, and defining with the body a first chamber;

spring means disposed within the first chamber and operatively connected with the piston and body for urging the piston in a brake-applying direction;

a first valve for selectively directing pressurized fluid into said first chamber to urge the piston in a brake-applying direction in addition to the urging thereof by the spring means, and for selectively allowing release of fluid pressure from the first chamber;

the body and piston defining a second chamber, introduction of pressurized fluid to the second chamber urging the piston in the brake-releasing direction against the resilience of the spring means;

a second valve for selectively directing pressurized fluid into said second chamber, and for selectively allowing release of fluid pressure from the second chamber;

means for providing that the first valve is directly responsive to release of fluid pressure from the second chamber to direct pressurized fluid into the first chamber and responsive to direction of pressurized fluid to the second chamber to release pressurized fluid from the first chamber; and

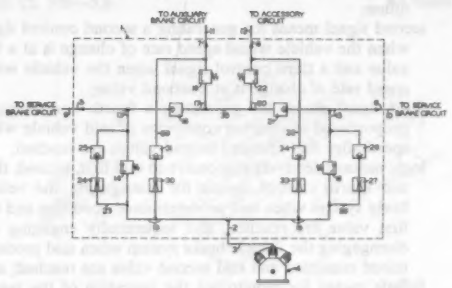
orifice means through which pressurized fluid is applied from the first valve to the first chamber for delaying full application of pressurized fluid to the first chamber upon release of fluid pressure from the second chamber.

4,057,298

SAFETY VALVE DEVICE FOR MULTIPLE CIRCUIT FLUID PRESSURE OPERABLE BRAKE SYSTEM

Güenter Seegers, Barsinghausen, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed Feb. 24, 1977, Ser. No. 771,767
Int. Cl.² B60T *17/18*
U.S. Cl. 303—84 R **6 Claims**



1. A safety valve device for a multiple fluid pressure operable brake system, said safety valve device comprising:

a. a casing having an inlet port connected to a source of fluid under pressure and a plurality of outlet ports connected to a plurality of fluid pressure circuits each requiring a predetermined degree of operating fluid pressure, respectively, said circuits being communicable with said inlet port via supply passageways;

b. respective cut-out valves interposed in said supply passageways between said fluid pressure circuits and said inlet port and being operable to respective open positions responsively to fluid pressure in the supply passageways at degrees corresponding to those required by the pressure circuits, respectively, for opening communication through the supply passageways between said pressure circuits and said inlet port;

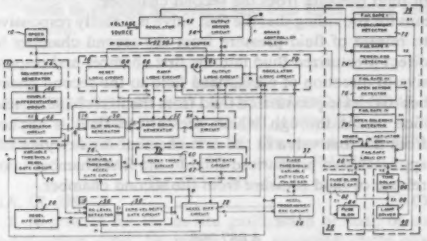
c. bypassing passageways means interposed in said supply passageways for providing restricted flow of fluid pressure from said inlet to said fluid pressure circuits in bypassing relation to the cut-out valves, respectively; and

d. a plurality of check valves interposed, respectively, between said several fluid pressure circuits for providing flow of fluid pressure thereto in one direction from said supply passageways and for inhibiting flow of fluid pressure in an opposite direction from certain selected ones of said circuits to the remaining circuits in the event of failure of fluid pressure in said certain selected ones of said circuits.

4,057,299
FAIL SAFE CIRCUIT FOR VEHICLE SKID CONTROL BRAKE SYSTEM

James J. Jones, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 266,798, June 27, 1972, Pat. No. 3,982,793.
This application Aug. 9, 1976, Ser. No. 712,638
Int. Cl.[2] B60T 8/02
U.S. Cl. 303—92 10 Claims



1. A vehicle brake control system for selectively controlling the engagement and disengagement of a brake system of a vehicle in accordance with selected braking conditions, comprising in combination:

first signal means for generating a first control signal when the relationship between signals representing vehicle speed and vehicle wheel speed is at a predetermined condition;

second signal means for generating a second control signal when the vehicle wheel speed rate of change is at a first value and a third control signal when the vehicle wheel speed rate of change is at a second value;

third signal means for generating a fourth control signal proportional to selected conditions of said vehicle wheel speed after said first and second values are reached;

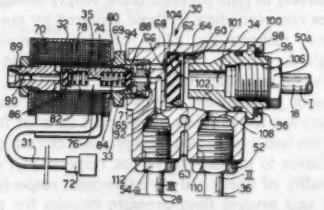
logic means selectively responsive to said first, second, third and fourth control signals for disengaging the vehicle brake system when said predetermined condition and said first value are reached, and sequentially engaging and disengaging the vehicle brake system when said predetermined condition and said second value are reached; and

failsafe means for monitoring the operation of the system and for selectively providing visual and audible signals indicative of system failure and for disconnecting system power so as to prevent damage to the components thereof.

4,057,300
MOTOR VEHICLE BRAKING SYSTEM

Giancarlo Michellone, Cambiano (Turin), and Virginio Maggioni, Rosta (Turin), both of Italy, assignors to FIAT Societa per Azioni, Turin, Italy

Filed Oct. 14, 1976, Ser. No. 732,224
Claims priority, application Italy, Oct. 31, 1975, 69706/75
Int. Cl.[2] B60T 8/04
U.S. Cl. 303—113 5 Claims



1. In a fluid operated motor vehicle braking system for at least two wheels of one axle of the vehicle, of the type comprising

main braking pressure generating means,

means for applying braking pressure from said main braking pressure generating means to brake actuators of both wheels of said axle for simultaneous braking of said two wheels of said axle,

auxiliary braking pressure generating means, and

means for applying a reduced braking pressure generated by said auxiliary braking pressure generating means to one of said wheels of said axle if its dynamic state approaches a skid or incipient skid state, while continuing to apply the full braking pressure to the other wheel of said axle if it is not in a skid or an incipient skid state,

the improvement wherein:

said means for applying a reduced braking pressure generated by said auxiliary braking pressure generating means comprises:

distribution means associated with each wheel of said axle, said distribution means including,

an electrovalve,

a distributor,

a first port of said distributor connected to said main braking pressure generating means,

a second port of said distributor connected to a brake pipe leading to the brake actuator of an associated wheel of said axle,

a third port of said distributor connected to a conduit leading to said auxiliary braking pressure generating means,

a main chamber of said distributor,

a main valve shutter slidingly housed in said main chamber and separating said main chamber into first and second compartments said first compartment communicating with both said first and said second ports,

means defining a first communication passage leading from said second compartment to said electrovalve,

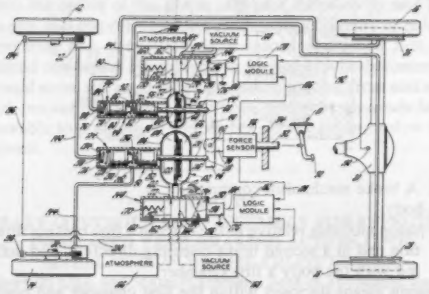
means defining a second communication passage leading from said third port to said electrovalve,

a valve shutter of said electrovalve controlling communication between said first communication passage and said second communication passage whereby to close communication between said third port and said second compartment of said main chamber when said electrovalve is in a first operating position and to open such communication when said electrovalve is in a second operating position, said main shutter being displaced by pressure in said second compartment of said main chamber when said electrovalve is in said second operating position whereby to close communication between said first and said second ports and to open communication between said third and said second ports.

4,057,301
BRAKE SYSTEM

David J. Foster, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 21, 1976, Ser. No. 697,954
Int. Cl.[2] B60T 8/04
U.S. Cl. 303—114 1 Claim



1. A brake system comprising:

first and second brake booster and master cylinder assemblies each including a brake booster having a power wall adapted to be exposed to differential pressures acting thereacross and in one condition urging the power wall to a brake release position and in another condition urging

the power wall to a master cylinder actuating position, and a master cylinder variably actuatable by said power wall in its master cylinder actuating position and connected to actuate a wheel brake for braking a wheel having a wheel speed sensing means associated therewith;

first and second pressure sources operatively connected to said boosters to provide the differential pressures on opposite sides of said power walls;

control means including first and second valve mechanisms for respectively controlling the application of the differential pressures from said sources to opposite sides of the power walls of the first and second boosters, said valve mechanism in one condition selectively applying the higher of said differential pressures to one side and the lower of said differential pressures to the other side of the power walls to urge the power walls to their brake release positions and in another condition selectively applying the higher of said differential pressures to the other side and the lower of said differential pressures to the one side of each of the power walls to urge the power walls toward their master cylinder actuating positions;

and signal generating means for generating signals controlling said control means in accordance with applied brake force, said signal generating means including a sensor generating a wheel deceleration demand signal responsive to manual operating force delivered to said brake booster and master cylinder assemblies, said wheel deceleration demand signal actuating the master cylinders boosted by said brake boosters to the extent differential pressures are selectively applied across said power walls by said valve mechanisms;

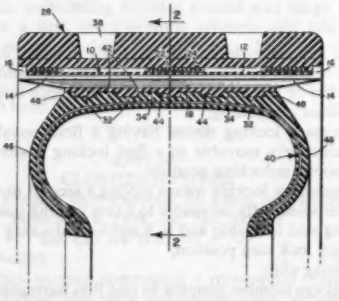
said signal generating means further including first and second logic control means respectively for said first and second valve mechanisms, said first and second logic control means receiving signals from said wheel decleration demand sensor and respectively from said wheel speed sensing means of said first and second brake booster and master cylinder assemblies and independently acting upon the receipt of a signal from the associated wheel speed sensing means indicating actual wheel deceleration in excess of the demanded wheel deceleration to independently operate said first and second valve mechanisms to independently apply the differential pressures to opposite sides of a related power wall while in its master cylinder actuating position in a manner to decrease the actuation of the master cylinder by said related power wall.

4,057,302

REMOVABLE TREAD BELT

V. A. Caravito, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,434
Int. Cl.² B62D 55/24
U.S. Cl. 305—19 **15 Claims**



1. A removable tread belt for installing about the circumferential outer surface of a tire carcass comprising:

an annular belt matrix of axial width greater than that of said circumferential outer surface of said tire whereby said belt matrix will extend outwardly beyond the edges of said circumferential outer surface,

a plurality of rigid bars installed in said belt matrix around the circumference thereof, each of said bars extending across the entire axial width of said belt matrix and being oriented parallel to a plane through the axis of rotation of the tire carcass, each said bar comprising a main portion oriented substantially perpendicular to a radius of said tire carcass and a rib oriented substantially radially of said tire, said main portion having a substantially rectangular cross-section with the long axis thereof oriented perpendicularly to a radius of the tire carcass and having a substantially unbroken bar outer surface distal said tire carcass extending across the axial width of said bar,

an inextensible annular belt installed in said belt matrix and located radially outwardly of said bar outer surface,

a ground contacting tread pattern on the outer circumferential surface of said belt matrix, and

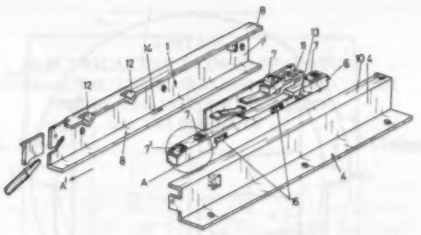
interlocking structure on the inner surface of said belt matrix for engaging complementing interlocking structure carried by the tire carcass.

4,057,303

DRAWER GUIDE

Erich Röck, Hochst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft mbH, Hochst, Austria

Filed May 20, 1976, Ser. No. 688,482
Claims priority, application Austria, May 23, 1975, 3950/75
Int. Cl.² F16C 29/02
U.S. Cl. 308—3.6 **9 Claims**



1. A drawer guide assembly for a drawer positionable in a structure employing support rail means disposed on each side of said structure in cooperative working relation with guide rail means positioned on each side of the drawer, said guide assembly including: roller means carried in a floating roller carrier means being operable with respect to the said guide assembly, said roller carrier means having additional roller means co-acting with said guide assembly and in tandem arrangement to said roller means to thereby increase the load characteristics of said drawer.

4,057,304

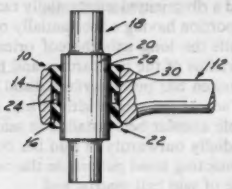
HEAVY DUTY RESILIENT COUPLING ASSEMBLY

Donald R. Gaines, Farmington Hills; Jon M. Smallegan, Ann Arbor, and William H. Trudeau, Brighton, all of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Nov. 1, 1976, Ser. No. 737,071
Int. Cl.² F16C 9/04
U.S. Cl. 308—237 A **19 Claims**

1. A resilient coupling assembly comprising a housing member having a generally cylindrical bore opening to the exterior thereof, a shank member having a generally cylindrical portion received in said bore with an annular space between said bore and said cylindrical portion of said members, a one-piece circumferentially continuous bushing of a resilient elastomeric material received between said members and constructed and arranged with a generally circular outer surface portion in engagement with said cylindrical bore of said housing member and a generally inner surface portion in engagement with said cylindrical portion of said shank member, said bushing having

a plurality of circumferentially spaced retainer passages each extending generally radially through said bushing and opening into both said cylindrical bore and said cylindrical portion of said members, and a plurality of bearing inserts each received in only one of said retainer passages and between said cylindrical bore and cylindrical portion of said members, each of said



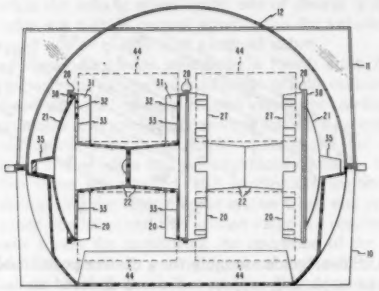
bearing inserts being dimensioned to provide a clearance between each bearing insert and said cylindrical bore and cylindrical portion of said members when said members are unloaded, said bushing being compressible to at least the extent of said clearance without rupture of said resilient elastomeric material.

4,057,305

ROTATABLE CASSETTE HOLDER

William Thomas Zdeblick, Park Ridge, Ill., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 10, 1976, Ser. No. 684,994
Int. Cl.² A47B *81/06*; A47F *1/04*; G11B *1/00*; B65D *85/672*
U.S. Cl. 312—11 **10 Claims**



1. A recording tape cassette container comprising
a base member presenting horizontally spaced trunion supporting surfaces formed about a horizontal axis;
a cassette retaining holder including horizontally spaced trunion projections mounted on said base member supporting surfaces for rotation about a horizontal axis;
spaced opposed channels including web and flange surfaces formed in said holder for receiving tape cassettes in angularly spaced, spoke-like relation about said horizontal axis; and
retaining means in said opposed channel web surfaces for releaseably securing said cassettes respectively in said spaced, opposed channels.

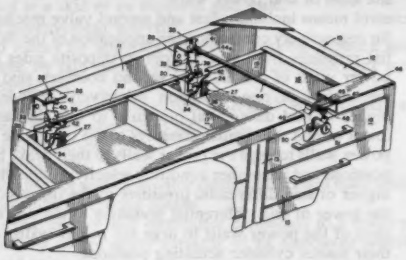
4,057,306

GANG LUCK ASSEMBLY FOR CABINET DRAWERS

Alvin Charles Resch, Jr., Two Rivers, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed June 17, 1976, Ser. No. 697,248
Int. Cl.² E05B *65/46*
U.S. Cl. 312—218 **8 Claims**

1. A gang lock assembly for locking a plurality of drawers in a cabinet, each drawer being slidably mounted in the cabinet for movement between a closed position and an open position in which the drawer extends forwardly from the front of the cabinet, the gang lock assembly comprising a latch mounted on the rear end of each drawer, a vertically extending locking bar pivotally mounted on the cabinet behind each drawer for pivoting movement about a vertical axis, each locking bar being pivotable between a locking position in which the locking bar is engageable with the latch on the drawer forwardly of the bar when the drawers are in their closed position to prevent movement of the drawers to their open position and an unlocking position in which the locking bar is not engageable with the latch on the drawer forwardly of the bar, an actuating rod mounted on the cabinet and connected to the locking bar



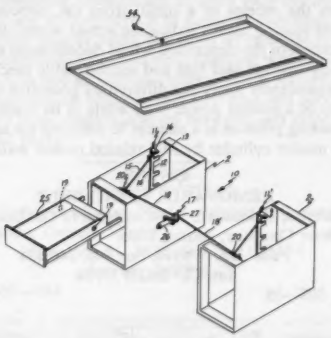
behind one of the drawers, the actuator rod being movable between a forward position in which the locking bar is in its unlocking position and a rearward position in which the locking bar is in its locking position, and cam means on said one drawer engageable with the actuator rod for moving the actuator rod to its rearward position when said one drawer moves to its closed position whereby the actuator rod pivots the locking bar to its locking position.

4,057,307

LOCKING SYSTEM LINKAGE ADJUSTMENT

Douglas Scheerhorn, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed July 22, 1976, Ser. No. 707,860
Int. Cl.² E05B *65/46*
U.S. Cl. 312—219 **13 Claims**



1. A locking system for locking the drawers, doors or like components of a desk pedestal or like compartment, said drawers, doors or like components including a lock stop, said locking system comprising;
a primary locking means having a first movable member selectively movable to a first locking position and to a second unlocking position;
a secondary locking means having a second movable member selectively moveable to a first locking position engaging said lock stop and to a second unlocking disengaging said lock stop position;
a spring clip;
a linkage member coupled to said first moveable member of said primary locking means by said spring clip and to said second moveable member of said secondary locking means for coupling movement between said first and second movable members; and
said spring clip being releaseably coupled to one of said linkage member and said first moveable member and being

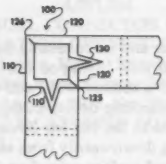
coupled to the other thereof, said one of said linkage and first moveable members having sufficient length that said spring clip can be releaseably secured in a plurality of different positions along said length so that the position of said spring clip can be changed thereby changing the effective length of said linkage member and effecting adjustment between the relative positions and movements of said first and second movable members of said primary and secondary locking systems.

4,057,308

COLLAPSIBLE WALL STRUCTURE FOR CABINETS OR CHESTS

John M. Dunning, III, Greensboro, N.C., assignor to Dunning, Ltd., Sanford, N.C.

Filed May 27, 1976, Ser. No. 690,399
Int. Cl.[2] A47B *43/00*
U.S. Cl. 312—262 **2 Claims**



1. A foldable wall structure for prefabricated cabinet or chest enclosures comprising:

a. a base wall having front and rear surfaces;

b. a pair of opposing side walls each having inner and outer surfaces;

c. a foldable hinge means permanently secured to said wall structure and connecting said base wall to each of said walls along adjacent edges;

d. said hinge means including an elongated, rectangular, tubular plastic extrusion extending transversely to the longitudinal axis of said base wall and side walls, said rectangular extrusion being formed of a pair of perpendicularly arranged outer walls and a pair of perpendicularly arranged inner walls, said inner and outer walls being connected together to form said rectangular extrusion, said plastic extrusion being at least partially continuous between the adjacent edges of said exterior walls and being completely discontinuous between adjacent edges of said interior walls, and a means for connecting each of said interior walls to the adjacent edge of one of said side walls and said adjoining edge of said base wall, whereby said extrusion hingedly connects a side edge of said base wall to the adjacent side edge of each of said side walls; and

e. said side walls being foldable around said hinge means between a first, erect position wherein said side walls extend perpendicularly forward from the edges of said base wall and a second, shipping/storage position wherein said side walls are folded substantially 270° from said first position to lie flat against the rear surface of said base wall.

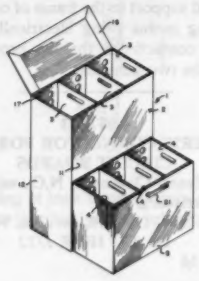
4,057,309

CLOTHES HAMPER

Eleanor M. Fragale, 4931 Fairview, St. Louis, Mo. 63139

Filed July 6, 1976, Ser. No. 702,919
Int. Cl.[2] A47B *81/00, 43/02*
U.S. Cl. 312—290 **9 Claims**

1. A clothes hamper comprising a rectangular main container having front, side, back and bottom walls, an open top, and a hinged cover for said open top, said front wall having an opening extending substantially from side wall to side wall in its lower part, and a central horizontal partition shelf defining an upper, open-topped compartment and a lower, open-fronted compartment; a plurality of upper, open-topped, free-standing sub-containers removably mounted in said upper compartment for insertion into and removal from said compartment vertically, and a plurality of lower, open-topped, free-standing sub-containers mounted in said lower compartment for movement into and out of said lower compartment laterally through said front wall opening, each of said sub-containers being



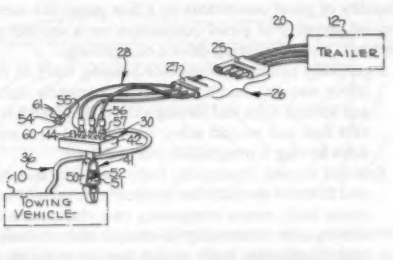
dimensioned to receive a wash machine load of a type of laundry, said sub-containers in each of said compartments being immediately contiguous one another and collectively contiguous the entire inner wall of said compartment when mounted within said compartments, and each sub-container being removable from and replaceable in said compartment individually, without moving any other sub-container.

4,057,310

ELECTRICAL COUPLING APPARATUS

Clyde J. Young, Rte. 2, Box 165A, Laurel Hill, N.C. 28351

Filed Sept. 14, 1976, Ser. No. 723,145
Int. Cl.[2] B60D *1/08*
U.S. Cl. 339—10 **5 Claims**



1. An electrical coupling apparatus for interconnecting respective first and second multi-conductor electrical circuits of releasably interconnected vehicles, such as an automobile and trailer, and having provision for assuring a desired connection between the several conductors in said first and second circuits, said apparatus comrising

polarized coupling means for releasably interconnecting said first and second circuits with a fixed predetermined arrangement of the several conductors thereof, and

universal coupling means interposed between said polarized coupling means and one of said first and second circuits for selectively and releasably interconnecting the conductors of said one circuit and the conductors of an intermediate multi-conductor electrical circuit, said universal coupling means comrising

a. an electrically insulating support,

b. a plurality of spaced apart, electrical contacts carried by said support, with each conductor of one of said one circuit or said intermediate circuit being electrically connected to separate ones of said contacts,

c. a plurality of individual terminals, with each conductor of

the other of said one circuit or said intermediate circuit being electrically connected to separate ones of said terminals,

d. means for releasably interconnecting each of said terminals with any one of said contacts, whereby said terminals may be selectively interconnected to said contacts in any desired arrangement; and

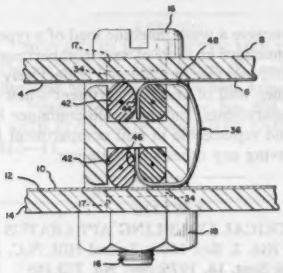
e. electrically conductive clamping means for releasably attaching said support to the frame of one of said vehicles, said clamping means being electrically connected with one of said contacts for thereby providing a common ground for the two vehicles.

4,057,311

ELASTOMERIC CONNECTOR FOR PARALLEL CIRCUIT BOARDS

William Robert Evans, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 11, 1976, Ser. No. 740,981
Int. Cl.² H05K 1/12
U.S. Cl. 339—17 M **5 Claims**



1. An electrical connecting device for connecting a first plurality of panel conductors on a first panel-like member to a second plurality of panel conductors on a second panel-like member, said connecting device comprising:

a generally prismatic connector housing body of rigid insulating material, said body having oppositely directed first and second sides and having a third side which is between said first and second sides, each of said first and second sides having a trough-like recess therein,

first and second elastomeric body means in said recesses in said first and second sides respectively, each of said elastomeric body means comprising two elastomeric bodies in side-by-side relationship in one of said recesses, each of said elastomeric body means having projecting surface portions which project beyond said first and second sides respectively,

a flexible circuit having opposite edge portions, said edge portions being held between said elastomeric bodies in each of said recesses and extending over said projecting surface portions of said elastomeric body means, said flexible circuit having intermediate portions which extend over said third side of said housing body,

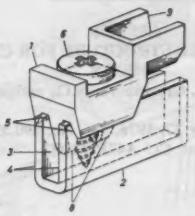
said flexible circuit having parallel spaced-apart flexible circuit conductors thereon extending between said opposite edge portions whereby, upon mounting said panel-like members in parallel spaced-apart relationship with said first conductors opposed to said second conductors and with said connecting device between said panel-like members, said projecting portions of said elastomeric body means will be compressed towards said first and second surfaces, and said flexible circuit conductors will be urged against said panel conductors and said first panel conductors will be electrically connected to said second panel conductors.

4,057,312

CONNECTING DEVICE AT A BUS BAR

Kjell Gustaf Roland Hagermo, Skarholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 6, 1976, Ser. No. 712,208
Claims priority, application Sweden, Sept. 5, 1975, 7509890
Int. Cl.² H01R 9/10
U.S. Cl. 339—21 R **5 Claims**



1. A U-shaped bus bar and a connecting device for connecting an electric wire to said U-shaped bus bar, said bus bar having a first wall and a second wall, and a groove defined therebetween, said connecting device comprising: a connecting piece for connection to the bus bar having a main portion, a first surface extending downwardly from said main portion at one side thereof, a second surface extending downwardly from said main portion at the other side thereof so as to form an open gap therebetween with said first surface, each of said first and second surfaces having sloping surfaces which slope inwardly from the bottom thereof to the top thereof toward the other of said first and second surfaces, the distance between corresponding points on said sloping surfaces gradually decreasing so that along corresponding portions of said surfaces the distance therebetween is greater than the distance between the outer parts of said first and second walls of said bus bar and along the remaining corresponding portions of said surfaces the distance therebetween is less than the distance between the outer parts of said first and second walls, said inwardly sloping surfaces contacting said first and second walls to push said walls toward each other when said connecting piece is mounted to said bus bar, said main portion having an opening extending therethrough and formed between said first and second surfaces, said connecting piece further comprising a screw extending through said opening, said screw gripping the inner surfaces of said first and second walls to thereby mount said connecting piece to said bus bar, and means for electrically connecting an electric wire to said main portion and therefore to said bus bar via said first and second surfaces and said screw, said means being mounted on said main portion.

4,057,313

TEST CLIP

Ida Polizzano, 235 S. Harrison St. Apt. 308, East Orange, N.J. 07018

Filed July 19, 1976, Ser. No. 706,171
Int. Cl.² H01R 11/24, 27/00
U.S. Cl. 339—33 **2 Claims**

1. An electrical test connecting device comprising:

an alligator clip including

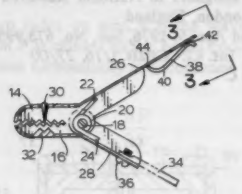
a pair of conductive gripping jaws attached to each other and a conductive leg connected to each jaw, an inner surface of one leg being opposed to an inner surface of the other leg,

spring means for biasing said jaws towards each other,

an electrical conductor connected to one of said legs adapted to be connected to a testing device; and

a conductive clip attached to the inner surface of said other leg, said clip being resilient, elongated, and providing oppositely longitudinally extending arcuate end portions, one of said arcuate end portions being fixedly secured on

the transverse edge thereof to said inner surface, said other arcuate end portion being biased toward said other leg, said clip adapted to frictionally retain and conductively engage an electrical terminal disposed between said clip and the inner surface of said other leg.



4,057,314

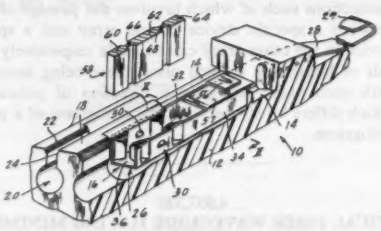
ELECTRICAL CONNECTOR INCLUDING INSULATION-OPENING CONTACT

Istvan Mathe, and Alan Henry Kasper, both of Cicero, Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 20, 1975, Ser. No. 606,121

Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—97 R **42 Claims**



1. An insulation-piercing contact for electrical connection to an insulated conductor, comprising:

a sheet metal structure including first and second surfaces and forming an open channel for receiving an insulated conductor normal to its axis, said channel including a bottom wall and a pair of spaced sidewalls extending generally parallel to each other from said bottom wall,

at least one pair of interior walls extending inwardly of said channel from respective ones of said sidewalls;

each of said interior walls comprising an oblique portion of one of said surfaces directed away from the respective sidewall and toward said bottom wall, a conductor wiping portion of said one surface extending generally in the direction of conductor insertion, an insulation opening portion of said one surface joining said oblique and wiping surface portions and defining a direction change therebetween, and a smooth portion on said oblique surface immediately adjacent said insulation opening portion.

4,057,315

CIRCUIT BOARD PIN

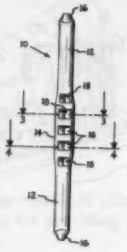
Norman Jay Miller, East Petersburg; John Anthony Zemaitis, Tower City, and Russell Lloyd Zimmerman, Etters, all of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 2, 1976, Ser. No. 710,617

Int. Cl.[2] H05K *1/18*

U.S. Cl. 339—221 R **4 Claims**

1. An elongated round circuit board pin having an expanded mounting portion characterized by an irregular surface defined by segments between plural equispaced longitudinal rows of wedge shaped voids, each void having a pair of inwardly directed walls meeting at a longitudinal apex substantially parallel to the axis of the pin, the voids in adjacent rows being staggered, there being at least three voids in each row at least one void in each row longitudinally overlapping a pair of voids in an adjacent row.



4,057,316

REFLECTION REDUCING MULTILAYER SYSTEM ON A HIGHLY REFRACTIVE INFRARED TRANSMITTING SUBSTRATE

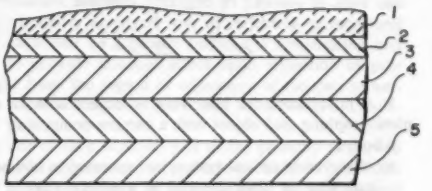
Dionys Hacman, Trubbach, Switzerland, and Adolf Keutschegger, Triesenberg, Liechtenstein, assignors to Balzers Patent- und Beteiligungs-Aktiengesellschaft, Liechtenstein

Filed Feb. 17, 1976, Ser. No. 658,454

Claims priority, application Switzerland, Feb. 18, 1975, 002014/75

Int. Cl.[2] G02B *5/28*

U.S. Cl. 350—1 **10 Claims**



1. A reflection reducing multilayer system on a germanium substrate, said system comprising four individual layers arranged in sequence as follows: Ge, ZnSe, Si and Al_2O_3.

4,057,317

HOLOGRAM PROJECTOR

Juris Upatnieks, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

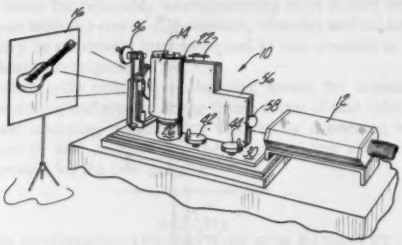
Filed Nov. 21, 1975, Ser. No. 634,147

Int. Cl.[2] G02B *27/00*

U.S. Cl. 350—3.5 **10 Claims**

1. A projector for creating a two-dimensional image on a planar surface from a hologram, comprising: means for supporting the hologram; a source of an illuminating light beam; means for directing said light beam at various sections of said hologram by moving said light beam relative to said hologram along two perpendicular axes so as to be operative to illuminate said sections of said hologram to create a three-dimensional image of the object in space; lens means operative to

project a magnified image of said sections of said three-dimensional image created by said light beam; means for selectively



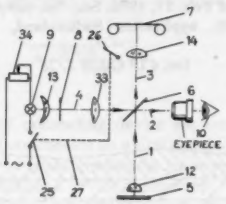
varying the focal plane of the image projected by said lens means within said three-dimensional image.

4,057,318

MICROSCOPE EYE PIECE FOCUSING APPARATUS FOR USE IN PRODUCING SHARP PHOTOGRAPHS

Klaus P. Schindl, Vienna, Austria, assignor to C. Reichert Optische Werke, Vienna, Austria

Continuation of Ser. No. 447,808, March 4, 1974, abandoned. This application Dec. 31, 1975, Ser. No. 645,487
Claims priority, application Austria, Mar. 2, 1973, 1871/73
Int. Cl.² G02B *21/18*
U.S. Cl. 350—19 **6 Claims**



1. A microscope for observing an object with an eye and photographing said object with a camera comprising

a body,

an observation optical system incorporated in said body and including an objective and an eyepiece aligned along a first optical axis, said eye and said eyepiece in combination having an effective focal plane, focusing means to form an image of said object in said effective focal plane,

a reference focusing system incorporated in said body and including a reticle aligned along a second optical axis which intersects said first optical axis, means to project an image of said reticle to a position along said first optical axis, means to prevent projection of said image during photographic exposure, means to move said eyepiece along said first optical axis for observing said image of said reticle in focus, said effective focal plane being located on said first optical axis at said position when the image of the reticle is observed in-focus,

a photographic optical system being adapted to connect to said body and having said camera on a third optical axis which intersects said first optical axis in said body, said first, second and third optical axes having a common intersection, said camera further including a film plane and said film plane being located on said third optical axis at a location optically equivalent, with respect to said object, to said position,

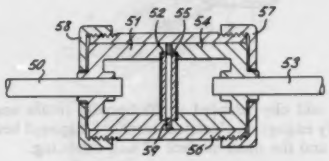
whereby focusing an image of said object at the position provides in-focus imaging of said object at said film plane.

4,057,319

OPTICAL SYSTEM USING A HOLOGRAM COUPLER

Eric Albert Ash, and Oliverio Delfim Dias Soares, both of London, England, assignors to National Research Development Corporation, London, England

Filed Apr. 5, 1976, Ser. No. 673,995
Int. Cl.² G02B *5/16, 27/00*
U.S. Cl. 350—96 C **14 Claims**



1. An optical connection system comprising:

two arrays of optical devices;

two multiple exposure phase hologram plates each having formed therein a series of phase holograms all of the transmission type; and

support means for supporting said plates respectively in fixed positions relative to said two arrays;

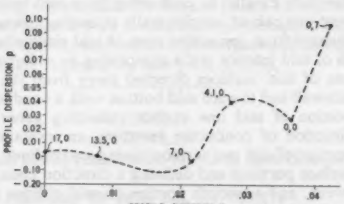
the holograms having forms such that individual optical connections each of which involves the passage of light between a specific device in one array and a specific device in the other array can be made respectively via a pair of holograms in each plate, there being associated with each phase hologram a direction of polarisation which differs by 90° between the holograms of a pair of holograms.

4,057,320

OPTICAL FIBER WAVEGUIDE HAVING MINIMUM MODAL DISPERSION

Enrique Alfredo Jose Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 26, 1976, Ser. No. 709,010
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 GN **8 Claims**



1. A circular-symmetric optical fiber waveguide comprising a core surrounded by a layer of cladding material, the refractive index of said layer n_2 being less than n_1, the value of the index of refraction on the axis of the core, and the index of refraction n in said core is graded in accordance with the following equation

$$n^2 = n_1^2(1-F),$$

where F is a profile function equal to zero on the axis and equal to $(n_1^2 - n_2^2)/n_1^2$ at the core-cladding interface, characterized in that the profile dispersion is a non-constant value with respect to radius given by the following equation

$$p = \frac{n_1}{N_1} \frac{\lambda}{F} \frac{\partial F}{\partial \lambda} ,$$

N_1 is the group index on axis, λ is the wavelength, and the profile function F is related to the radial coordinate r and the profile dispersion substantially in accordance with the following equation

$$\frac{1+\frac{r}{2F}\frac{\partial F}{\partial r}}{1-\frac{p}{2}} = D$$

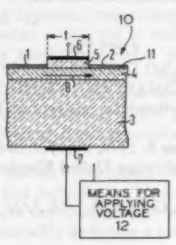
where D is a dispersion parameter approximately equal to 2.

4,057,321

SPECTROSCOPICALLY SELECTIVE FILTER DEVICE

Hans Mahlein, and Achim Reichelt, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 15, 1976, Ser. No. 677,448
Claims priority, application Germany, Apr. 18, 1975, 2517194
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 WG **9 Claims**



1. A spectroscopically selective filter device for light which is being conveyed in a film waveguide arranged on a substrate, comprising at least two Bragg reflectors with distributed feedback being disposed on a surface of the film waveguide in a spaced tandem arrangement of a given interval along the direction of light propagation in the film waveguide, a pair of electrodes arranged adjacent opposite surfaces of the film waveguide in each region between the two spaced reflectors, said film waveguide in at least the region between the electrodes consisting of an electro-optical material, and means connected to the electrodes for applying an electrical voltage to the electrodes so that the index of refraction of the electrical optical material is changed to adjust the length of the optical path between each pair of reflectors.

4,057,322

PRECISION SURFACE OPTICAL FIBERS

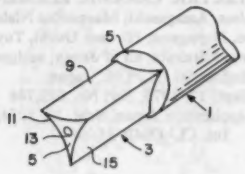
Charles K. Kao, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Nov. 5, 1975, Ser. No. 629,210
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 R **12 Claims**

1. A precision formed optical fiber comprising:

cylindrical core means for transmitting light energy through said fiber;

cladding means for promoting total internal reflection within said fiber; and



at least three intersecting reference planes formed on the surface of the cladding for providing low light loss connection with said fiber.

4,057,323

PROJECTION SCREEN

Robertson Ward, Jr., 21 W. Elm St., Chicago, Ill. 60610

Division of Ser. No. 502,157, Aug. 30, 1974, Pat. No. 3,992,841. This application Sept. 27, 1976, Ser. No. 727,255
Int. Cl.² G03B 21/56
U.S. Cl. 350—125 **4 Claims**

1. In a projection screen that includes a plurality of curved interior reflective surfaces arranged to provide at least one generally circularly arranged row of reflective surfaces and whereby each pair of adjacent surfaces is constructed and arranged to provide minimal effect upon reflection of projected light from the region of adjacency of the pair of surfaces, the improvement in construction comprising, in combination:

at least one of each adjacent pair of the plurality of curved surfaces being provided as part of a prefinished panel that is of a size and shape to have an edge portion thereof overlap an edge portion of the adjacent curved reflective surface;

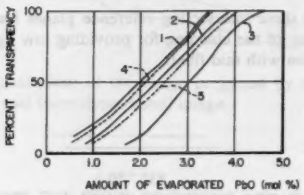
said prefinished panel including a substrate sheet of metal that is originally of uniform thickness and is deformable and easily set upon deformation beyond the metal's elastic limit, and a continuous uniform reflective finish provided on the concave side of the substrate metal sheet prior to deformation of the metal sheet;

a portion of the panel adjacent the edge thereof that overlaps the adjacent curved reflective surface being shaped and arranged and deformed, without destroying the continuous character of the uniform reflective finish on the metal substrate, to have the face of reflective finish at the edge terminus of the panel terminate adjacent the said adjacent reflective surface, with the thickness of the substrate sheet of metal adjacent said edge terminus being lessened, resulting in providing a back surface, opposite the reflective surface, that will lie adjacent the adjacent curved reflective surface, to cause the reflective finish at the edge terminus of the panel to be located closely adjacent the overlapped curved reflective surface, thereby minimizing any discontinuity between the reflective finish on the panel and the overlapped reflective surface.

4,057,324
METHOD OF MAKING A TRANSPARENT FERROELECTRIC CERAMIC ELEMENT

Syunichiro Kawashima, Amagasaki; Masamitsu Nishida, Osaka; Yoshihiro Matsuo, Neyagawa; Hiromu Ouchi, Toyonaka, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 12, 1975, Ser. No. 612,744
Claims priority, application Japan, Sept. 12, 1974, 49-105695
Int. Cl.[2] C04B 35/64
U.S. Cl. 350—150 3 Claims



1. A method of making a transparent ferroelectric ceramic element, comprising the steps of:

forming a solid solution of a material of the formula

$$Pb_{1-(3/2)t}La_t(Mg_{1/3}Nb_{2/3})_xZr_yTi_zO_r+\alpha PbO,$$

where $t=0.04$–0.15, $x=0.03$–0.60, $y=0.10$–0.95, $z=0.05$–0.90, $x+y+z=1$, and $\alpha=0.00$ –0.20;

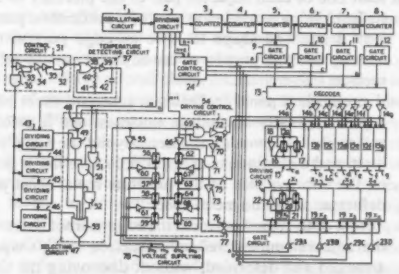
grinding said solid solution to form a ferroelectric powder; and

hot-pressing said powder at a temperature between 900° C and 1300° C and at a pressure of at least 1000 p.s.i. for a period of time which is sufficient to form a transparent ferroelectric ceramic element.

4,057,325
DISPLAY DEVICE

Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Apr. 29, 1976, Ser. No. 681,516
Claims priority, application Japan, May 1, 1975, 50-52832
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—160 LC 2 Claims



1. A temperature compensated time display device comprising in combination:

oscillator means for developing an oscillatory high frequency time standard signal;

counter and decoder means responsive to the time standard signal for developing periodic signals representative of time;

display means operable in a multiplex mode by driving signals for displaying time in response to the counter and decoder means output signals representaive of time;

temperature detecting means responsive to an output signal developed by said counter and decoder means for periodically developing an oscillatory signal having a frequency representative of ambient temperature;

a divider circuit connected to receive the oscillatory signal representative of ambient temperature for dividing the same;

selecting circuit means responsive to the divided signal representative of ambient temperature and to an output signal of said counter and decoder means for developing an oscillatory drive signal in synchronism with said output signal of said decoder and counter means and having a duty cycle representative of ambient temperature;

a voltage supply circuit for supplying a plurality of different value voltages; and

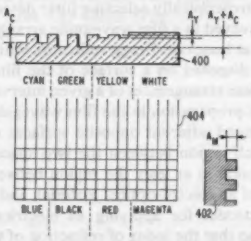
drive control means receptive of the voltages developed by said voltage supply circuit and responsive to the output signal of said selecting circuit means for driving said display means in a multiplex mode with the voltages developed by said voltage supply circuit at duty cycles corresponding to the duty cycles of said selecting circuit means output signal in order to display time represented by said counter and decoder means output signals;

whereby variations in driving voltages applied to said display means compensate for ambient temperature variations, and this compensation is adjusted periodically under control of said periodic output signal developed by said counter and decoder means and applied to said temperature detecting means.

4,057,326
SIMPLIFIED AND IMPROVED DIFFRACTIVE SUBTRACTIVE COLOR FILTERING TECHNIQUE

Karl Knop, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed June 9, 1976, Ser. No. 694,441
Claims priority, application United Kingdom, May 27, 1976, 51272/76
Int. Cl.[2] G02B 5/18, 5/22
U.S. Cl. 350—162 R 11 Claims



1. A diffractive substractive color filter responsive to illumination thereof with white light for deriving colored zero order diffraction light, said filter comprising:

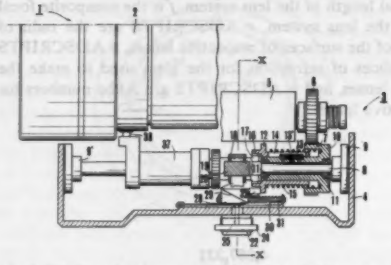
a variable optical amplitude binary phase delay diffractive structure selectively comprising no more than three different optical amplitudes consisting of a given first optical amplitude corresponding to cyan zero order diffraction light, a given second optical amplitude corresponding to yellow zero order diffraction light, and a third optical amplitude substantially equal to the sum of said first and second amplitudes and corresponding to green zero order diffraction light, and

wherein said structure comprises a plurality of separate regions including a first region, having said third optical amplitude and a second region having solely one of said first and second optical amplitudes.

4,057,327
DRIVE APPARATUS FOR AN OPTICAL SYSTEM

Kenichi Kumazawa, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 465,511, April 30, 1974, abandoned.
This application Dec. 23, 1975, Ser. No. 643,960
Claims priority, application Japan, May 8, 1973, 48-50956
Int. Cl.[2] G02B 7/04
U.S. Cl. 350—187 4 Claims



1. A driving apparatus for an optical system having an optical axis, said optical system comprising a fixed section including a fixed optical component and a displaceable section including a movable optical component displaceable relative to said fixed optical component along the optical axis of the system, the driving apparatus comprising:

an operable member connected to said displaceable optical component, a mechanical drive assembly including a motor means, a clutch means having an engaged position for connecting said mechanical drive assembly to said operable member and a disengaged position for disengaging said mechanical drive assembly from said operable means,

an intermediate manual drive means connected to said operable member and including a connecting member spaced from the point of the connection to said operable member,

a manual drive assembly including a coupling member selectively connectable to said connecting member for manually driving said operable member,

control means for selecting the engaged or disengaged positions of said clutch means,

said intermediate manual drive means including movable means engageable with said coupling member and being displaceable between an extended position when it is disengaged from said coupling member and a retracted position when it is engaged with said coupling member for actuating said control means and locating said clutch means in the disengaged position, and

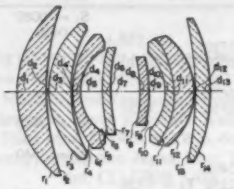
contact means displaceable by said movable means when said movable means is in the retracted position and said contact means arranged in the displaceable position in conjunction with said control means for effecting the disengagement of said clutch means.

4,057,328
ENLARGING LENS SYSTEM

Masaki Matsubara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Dec. 29, 1975, Ser. No. 645,210
Claims priority, application Japan, Dec. 30, 1974, 50-2223
Int. Cl.[2] G02B 9/64, 9/62
U.S. Cl. 350—214 4 Claims

1. An enlarging lens system comprising a first, second, third, fourth, fifth and sixth lens components, said first lens component being a positive meniscus lens, said second lens component consisting of a positive meniscus lens and negative meniscus lens, said third lens component being a thin lens having weak refractive power, said fourth lens component being a thin lens having weak refractive power, said fifth lens component being a cemented doublet lens consisting of a negative menis-



cus lens and positive meniscus lens, said sixth lens component being a positive meniscus lens, said enlarging lens system having numerical values as given below:

F/3.5 , $2\omega = 51°$, f = 100		
$r_1 = 43.002$		
$d_1 = 9.7$	$n_1 = 1.658$	$\nu_1 = 57.3$
$r_2 = 82.828$		
$d_2 = 0.94$		
$r_3 = 29.853$		
$d_3 = 7.89$	$n_2 = 1.651$	$\nu_2 = 56.2$
$r_4 = 45.678$		
$d_4 = 0.33$		
$r_4' = 31.564$		
$d_4 = 2.67$	$n_3 = 1.74$	$\nu_3 = 31.7$
$r_5 = 17.391$		
$d_5 = 7.36$		
$r_6 = 65.049$		
$d_6 = 3.21$	$n_4 = 1.511$	$\nu_4 = 60.5$
$r_7 = 89.759$		
$d_7 = 8.83$		
$r_8 = -80.717$		
$d_8 = 3.21$	$n_5 = 1.511$	$\nu_5 = 60.5$
$r_9 = -65.111$		
$d_9 = 5.82$		
$r_{10} = -19.141$		
$d_{10} = 2.67$	$n_6 = 1.755$	$\nu_6 = 27.5$
$r_{11} = -34.134$		
$d_{11} = 7.09$	$n_7 = 1.678$	$\nu_7 = 55.3$
$r_{12} = -22.956$		
$d_{12} = 0.28$		
$r_{13} = -109.774$		
$d_{13} = 5.35$	$n_8 = 1.678$	$\nu_8 = 55.3$
$r_{14} = -50.866$		
$f_3 = 442.5$,	$f_4 = 616$	

wherein reference symbol f represents the focal length of the lens system as a whole, reference symbols f_3 and f_4 respectively represent focal lengths of the third and fourth lens components, reference symbols r_1 through r_{14} respectively represent radii of curvature of respective lens surfaces, reference symbols d_1 though d_{13} respectively represents thickness of respective lenses and airspaces between respective lenses, reference symbols n_1 through n_8 respectively represent refractive indices of respective lenses and reference symbols ν_1 through ν_8 respectively represent Abbe's number of respective lenses.

4,057,329
ADJUSTABLE FOCAL LENGTH OPTICAL DESIGN

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 9, 1976, Ser. No. 712,637
Int. Cl.[2] G02B 9/42
U.S. Cl. 350—222 1 Claim

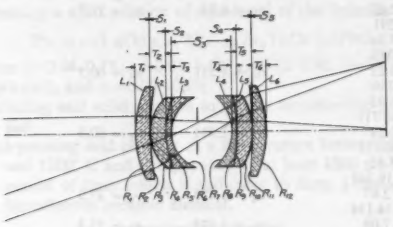
1. An optical design for a photographic objective lens having a plurality of elements, the outer of which are adjustable axially for adjusting the focal length such that pairs of lenses have focal lengths within very close tolerances, the optical design having substantially the following specifications:

Lens	Radii (in.)		Thickness (in.)	Spacing (in.)V	N_D	
L_1	$R_1 =$	.7750				
	$R_2 =$	−1.9120	$T_1 = .1070$		51.7	1.734

-continued

Lens	Radii (in.)	Thickness (in.)	Spacing (in.)V	N_D	
			S_1 = .0080 to .0430		
L_2	R_3 = .3720				
	R_4 = −.6670	T_2 = .1170		55.9	1.651
			S_2 = 0		
L_3	R_5 = .6670				
	R_6 = −.2850	T_3 = .0350		29.3	1.722
			S_3 = .1940		
	------ STOP ------				
			S_4 = .2540		
L_4	R_7 = −.3490				
	R_8 = 1.2250	T_4 = .0350		36.4	1.620
			S_5 = 0		
L_5	R_9 = −1.2250				
	R_{10} = .5180	T_5 = .1060		55.9	1.651
			S_6 = .0430 to .0080		
L_6	R_{11} = −5.8300				
	R_{12} = .8010	T_6 = .1210		51.7	1.734
			S_7 = .8818 BFL		

wherein the first column lists the lens elements numerically, the second column lists the respective radii of the elements, using the convention that convex surfaces have positive radii and concave surfaces are negative, the third column lists the



respective thicknesses of the elements, the fourth column lists the axial spacings between adjacent elements, the stop, and the film plane, and the fifth and sixth columns list respectively the dispersion and refractive indices of the optical materials for the lens.

4,057,330

LENS SYSTEM HAVING LARGE RELATIVE APERTURE AND LONG FOCUS

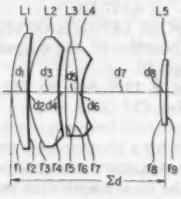
Sel Matui, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 3, 1974, Ser. No. 511,529

Claims priority, application Japan, Oct. 5, 1973, 48-111523

Int. Cl.² G02B *13/02*

U.S. Cl. 350—223 **4 Claims**



1. A lens system having a large relative aperture and long focus and having an object side and an image side, the system comprising, in series, as viewed from the object side, a positive first lens member having its convex surface facing the object side, a positive second lens member having its convex surface facing the object side, a negative third lens member, and a positive fourth lens member, the third lens member comprising a positive lens and a negative lens, the components of the lens system satisfying the following conditions:

(I) $0.4\,\Sigma d \leqq [d1 + d2 + d3 + d4 + d5 + d6] \leqq 0.53\,\Sigma d$, and

(II) $0.4f \leqq |r6| \leqq 0.7f$, $n3 > n4$, $32 > \nu 4 > \nu 3$,

where d ADSCRIPTS are the center thicknesses of the respective lenses and the air spaces between adjacent lenses, Σd is the total optical length of the lens system, f is the composite focal length of the lens system, r ADSCRIPTS are the radii of curvature of the surfaces of respective lenses, n ADSCRIPTS are the indices of refraction for the glass used to make the respective lenses, and ν ADSCRIPTS are Abbe numbers for the respective lenses.

4,057,331

ELECTRO-MAGNETICALLY CONTROLLABLE BEAM DEFLECTION DEVICE

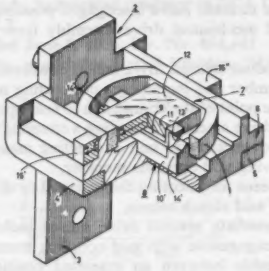
Daniël Ong, and Johannes Cornelius Antonius Muller, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,284

Claims priority, application Netherlands, Oct. 3, 1975, 7511635

Int. Cl.² G02B *27/17*

U.S. Cl. 350—285 **10 Claims**



1. An electro-magnetically controllable beam deflection device for use in an optical system for deflecting a radiation beam obtained from a radiation source, in particular to be used in a video player, and comprising:

a frame

a deflection means which is pivotably mounted on the frame

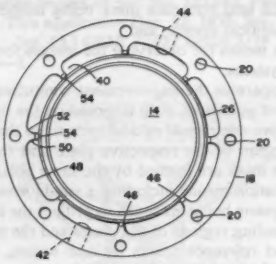
bearing means for pivotably supporting the deflection means by the frame, which bearing means comprise at least one integrated bearing component made of an elastic synthetic material, said bearing means having a first portion connected to the deflection means and a second portion connected to the frame, and

first and second electro-magnetic control means connected to the frame and the deflection means respectively, in the form of electro-magnetic circuits which include at least one electrical coil, the improvement wherein each integrated bearing component between said first and second portions comprises a third portion having a cross-section which is substantially smaller with respect to the other two portions, which third portion is comparatively readily deformable under the influence of the electro-magnetic control forces exerted on the deflection means.

4,057,332
PERIPHERALLY COOLED LASER LENS ASSEMBLY

Hiram A. Brubaker, Peoria; Gerald P. Simmons, Washington, and William E. Streight, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 21, 1976, Ser. No. 678,846
Int. Cl.[2] G02B 5/00
U.S. Cl. 350—319 10 Claims

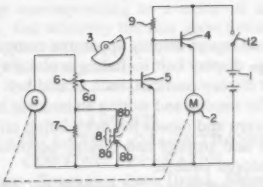


1. A fluid cooled lens assembly comprising:
a housing including a pair of generally ring-shaped members defining an opening therethrough for admitting energy rays,
a lens mounted in said opening in said housing, said lens defining a peripheral edge, and
cooling passage means in said housing, said cooling passage means comprising a passage within said housing circumscribing said lens peripheral edge and in fluid communication over said entire peripheral edge for directing coolant fluid to said lens peripheral edge for cooling said lens, and inlet and outlet ports in said housing in communication with said passage for admitting cool fluid and removing fluid that has been heated by said lens.

4,057,333
EXPOSURE TIME CONTROL DEVICE IN A CINECAMERA

Shigeo Akasaka, Kodaira, and Hiroaki Tanaka, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 608,007
Claims priority, application Japan, Aug. 30, 1974, 49-98936
Int. Cl.[2] G03B 7/08
U.S. Cl. 352—141 9 Claims

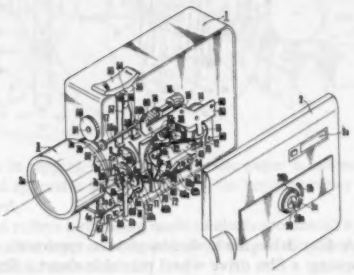


1. An exposure time control device for a cinecamera comprising:
a. rotatable shutter means;
b. means including an electric motor for driving said rotatable shutter means;
c. changing means operatively associated with said rotatable shutter means to change the number of revolutions of said electric motor within a period during which an aperture is opened and closed by said rotatable shutter means; and
d. circuit means for supplying an electrical signal to said motor for energization thereof, and wherein said changing means includes means to change the magnitude of said electrical signal within a period during which an aperture is opened and closed by said rotatable shutter means thereby to change the number of revolutions of said motor according to said magnitude.

4,057,334
SELF TIMER DEVICE FOR MOTION PICTURE CAMERA

Kazuo Ishikawa; Noritsugu Hirata, both of Yokohama; Tomoshi Takigawa, Machida, and Yasutsugu Yamada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,364
Claims priority, application Japan, Mar. 11, 1975, 50-29297
Int. Cl.[2] G03B 1/00
U.S. Cl. 352—175 26 Claims



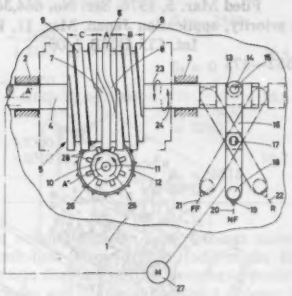
1. A self-timer device for a camera equipped with a driving motor for enabling automatic photography, comprising:
A. timer means for controlling a first time interval until the initiation of picture-taking operation, said timer means having a spring means capable of charging by manual operation and operating to control said first time interval by the force which is charged in said spring means;
B. first operation means for the initiation of the picture-taking operation, said first operating means being operatively associated with said timer means and initiating the picture-taking operation by energizing said driving motor when said first time interval elapsed;
C. manually operable means concurrently applied to the charging of said spring means and to the controlling of a second time interval until the termination of the picture-taking operation subsequent to said first time interval, said manually operable means being shiftable between a first state operatively connected with said timer means and a second state operatively connected with said driving motor and, in said first state, said manually operable means being applied to the charging of said spring means by manual operation, while in said second state, said manually operable means operating to control said second time interval by the driving force of said driving motor upon the energization of said driving motor; said spring means being charged by manual operation to said manually operable means when said manually operable means is in said first state; said timer means initiating the operation for controlling said first time interval by the force which is charged in said spring means when said manually operable means is shifted from said first state to said second state by manual operation under the state that said spring means is charged; said manually operable means initiating the operation for controlling said second time interval by the driving force of said driving motor when said motor is energized by said first operating means after the lapse of said first time interval under the state wherein said manually operable means is shifted to said second state; and
D. second operating means to stop the picture-taking operation, said second operating means being operatively associated with said manually operable means and stopping the picture-taking operation by de-energizing said driving motor when said second time interval elapsed.

4,057,335

FILM DRIVE FOR MOTION PICTURE APPARATUS

Herbert Leisring, Fellbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 19, 1976, Ser. No. 677,884
Claims priority, application Germany, Apr. 24, 1975, 2518171
Int. Cl.[2] G03B *1/24*
U.S. Cl. 352—188 10 Claims



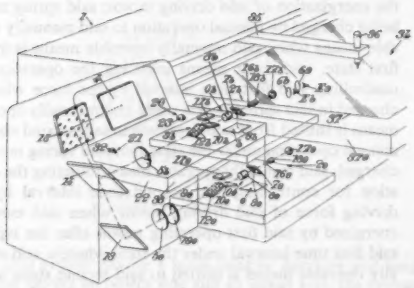
1. A film drive for a motion-picture apparatus, said drive comprising: a film drive wheel rotatable about a first axis and having relative thereto a plurality of angularly equispaced radially extending projections; a function cam rotatable about a second axis transverse to said first axis and having a generally helical peripheral formation engaging said wheel at said projections and including an intermittent-drive section having a holding portion constituting almost a complete turn of said formation of substantially 0° pitch and a switching portion of predetermined pitch greater than 0°, and a constant-drive section of constant pitch greater than 0° and axially offset from said intermittent-drive section; shift means for displacing said axes relative to each other for engagement of said projections with said intermittent-drive section or with said constant-drive section; and drive means for continuously rotating said cam about said drive axis, whereby said drive wheel is advanced intermittently when engaging said intermittent-drive section and continuously when engaging said constant-drive section.

4,057,336

PHOTOGRAMMETRIC PLOTTING APPARATUS

Noël Malinge, Clichy Sous Bois, France, assignor to Engins Matra, France

Filed June 7, 1976, Ser. No. 693,176
Claims priority, application France, June 26, 1975, 75.20164
Int. Cl.[2] G03B *21/00*
U.S. Cl. 353—6 14 Claims



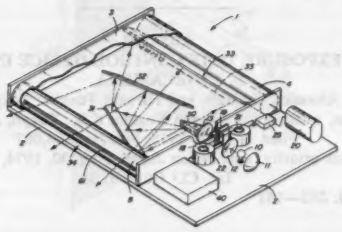
1. A photogrammetric plotting apparatus comprising:
two stereographic plates;
two optical systems having respective optical axes and each for forming an image of a region of a respective one of the two stereographic plates;
means for moving the stereographic plates in their plane with respect to said optical systems to bring corresponding regions of said plates onto the optical axes of said optical systems,
means providing a reference mark indicating the trace of the optical axis of each said optical system on the respective plate, each said reference mark being imaged by the respective optical system; and
observation means for observing the images formed by said optical systems;
in which apparatus the improvement comprises:
two different polarisers, each disposed on the optical axis of a respective one of said optical systems so that the images of the region of the respective plate and the respective reference mark are formed by the same polarised light;
said observation means including a single screen, and said optical system being arranged to project the images of the corresponding regions of the plates and the images of the associated reference marks on said screen, whereby an operator looking at said screen through two analyzers corresponding to said polarisers sees the images of the region of one plate and its respective reference mark with one eye only and sees the images of the corresponding region of the other plate and its respective reference mark with the other eye only.

4,057,337

COMPACT VIEWER

Lee Fitzpatrick Frank, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1976, Ser. No. 682,303
Int. Cl.[2] G03B *21/28*
U.S. Cl. 353—26 R 15 Claims



1. Improved image display apparatus comprising:
a. an image display belt including a plurality of image storage and display portions, each of said belt portions having means for sensing and storing an incident imagewise radiation pattern and means for modulating uniform light incident on said storage and display portions in accordance with a stored pattern;
b. means for supporting and moving said belt along an endless operative path;
c. a first recording station, located along said endless path;
d. an image projection station including means for receiving and supporting an information medium containing micro-images to be viewed and means for projecting, onto a portion of said display belt located at the recording station, a radiation pattern corresponding to the portion of the micro-image supported at said projection station;
e. means for moving a received information medium past said projection station in a predetermined time relation with movement of said belt so as to provide scanning radiation exposure of successive micro-image portions onto successive portions of said belt; and
f. an image viewing station located along said operative path and extending downstream from said recording station so

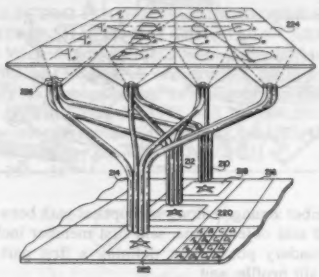
that an entire image comprised of successively recorded image portions can be viewed thereat.

4,057,338

FIBER OPTIC SYSTEM

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Division of Ser. No. 427,355, Dec. 21, 1973, and a continuation-in-part of Ser. No. 223,612, Feb. 4, 1972, abandoned. This application Dec. 23, 1975, Ser. No. 643,831
Int. Cl.² G03B *27/00*; G02B *5/14*
U.S. Cl. 355—1 2 Claims



1. A color optical system including,
a. a plurality of coherent light guides having input termini, said input termini each defining a bundle,
b. said coherent light guides diverging from each other over at least a portion of their length,
c. the distance between the output termini of said guides being greater than the distance between the input termini,
d. the output termini of said coherent light guides being rigidly positioned relative to each other,
e. a screen adjacent said output termini and adapted to either receive colored light output projected therefrom or to pass colored light to the output termini,
f. the said output termini each provided with a projecting lens interposed between it and said screen,
g. a plurality of said bundles,
h. a photographic film positioned beneath the input termini of said bundles for recording information on the screen,
i. a different wavelength filter positioned between the input termini of each bundle end and said film,
j. whereby unexposed film will record a number of identical black and white images equal to the number of bundles, each image corresponding to a color of an associated color filter, and whereby the film upon development will project a color image on the viewing screen from the black and white images.

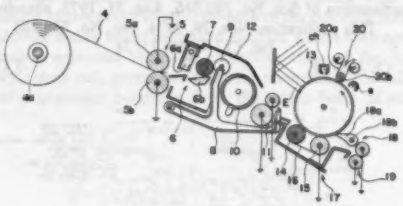
4,057,339

ELECTROSTATIC LATENT IMAGE TRANSFER TYPE COPYING APPARATUS

Osamu Miyamoto, Toyokawa; Isao Iizaka, Shinshiro; Toshio Yamamoto, Toyokawa; Takashi Hikosaka, Aichi, and Shigemitu Shimizu, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1975, Ser. No. 643,957
Claims priority, application Japan, Jan. 7, 1975, 50-4717; Jan. 13, 1975, 50-6835; Jan. 10, 1975, 50-6620[U]
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R 20 Claims

10. An electrostatic latent image transfer type copying apparatus which comprises;
a copying paper in a roll and having an insulative dielectric layer and an electroconductive layer over which said dielectric layer is coated;
a photoconductive member;
means for bringing said copying paper into contact with the photoconductive member with the dielectric layer contacting the photoconductive member for transferring said latent image onto the copying paper;
means for transporting the copying paper along a predetermined path to a developing means through said image transferring means, said transporting means including at least one pair of feed rollers in nipping relation to one another for transporting the copying paper therebetween, said feed rollers holding a leading end of the copying



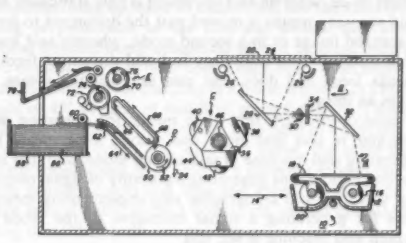
paper in nipping condition when the paper is not moving in said apparatus and transporting the copying paper when rotated;
said feed rollers both being made of electroconductive material with at least one of said roller being of electroconductive elastic material; and
means coupled to said rollers for maintaining said rollers at equal potential, whereby electrostatic contamination on the copying paper due to the compression and frictional charging by said rollers are prevented.

4,057,340

SINGLE COMPONENT COLOR DEVELOPMENT SYSTEM

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 22, 1976, Ser. No. 651,323
Int. Cl.² G03G *15/01*
U.S. Cl. 355—4 21 Claims



7. An electrostatographic printing machine of the type having a latent image corresponding to an original document being reproduced recorded on a member, wherein the improvement includes:
a housing defining a chamber for storing a supply of particles therein;
a cylindrical member mounted rotatably in the chamber of said housing, said cylindrical member having a plurality of apertures therein with each aperture being smaller in size than the size of the smallest particle attracted thereto;
a blower mounted interiorly of said cylindrical member and arranged to generate an inwardly directed flow of air from the surface of said cylindrical member to the interior thereof forming a pressure differential attracting the particles thereon; and
means for separating the particles from said cylindrical member as the particles advance to the development zone,

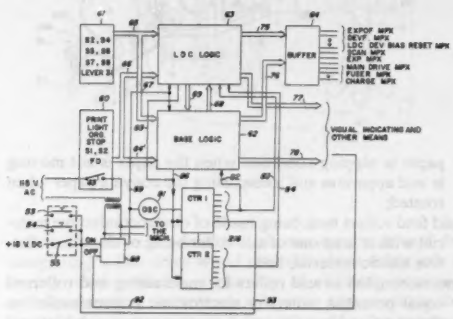
wherein said cylindrical member positions the particles closely adjacent to the latent image recorded on the member.

4,057,341

DUAL MODE CONTROL LOGIC FOR A MULTI-MODE COPIER/DUPLICATOR

Lawrence R. Sohm, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 393,546, Aug. 31, 1973, abandoned.
This application Nov. 29, 1974, Ser. No. 528,163
Int. Cl.[2] G03G *15/28*
U.S. Cl. 355—8 **5 Claims**



1. In an automatic reproducing machine comprising:
movable scanning means;
document original feeding means;
xerographic step implementing means including means for charging a photoreceptor layer; means for image-wise exposing said layer to form a latent electrostatic image; means for developing said electrostatic image; and means for transferring the developed image to a copy sheet; the improvement comprising:
a control circuitry for operating said machine selectively in a first mode, wherein said document is held stationary and said scanning means is moved past the document to form a scanned image or in a second mode, wherein said scanning means is held stationary and said document feeding means feeds said document past said scaning means to form an image,
said control circuitry first logic means for operating said machine in said first mode and second logic means for operating said machine in said second mode, said first and second logic means generating a plurality of signal outputs for actuating said xerographic step implementing means;
means for generating a signal indicative of the mode in which said machine is set; and
buffer means for receiving said actuating signal outputs and for selectively applying them to said implementing means, said buffer means including multiplexing means responsive to said mode signal for gating the desired actuating signal outputs corresponding to the mode in which the machine is set to said implementing means.

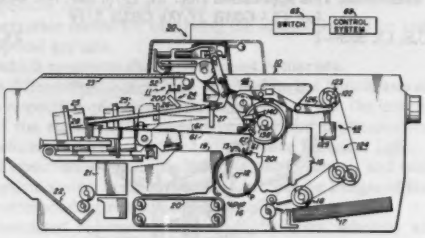
4,057,342

ILLUMINATION SLIT FOR A REPRODUCING MACHINE

Robert F. Allis, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 27, 1976, Ser. No. 690,475
Int. Cl.[2] G03G *15/28*; G03B *27/48, 27/70*
U.S. Cl. 355—8 **11 Claims**

1. In an apparatus including means for stripwise viewing an object at an object plane and for projecting an image thereof onto a moving imaging surface at an image plane, said viewing means being arranged along an optical path, said viewing means including:
a lens arranged along said optical path between said object plane and said image plane; and
means for controlling the projected illumination profile of said viewing means, including means for defining an illumination slit having a desired slit profile for controlling said illumination; the improvement wherein, said means for defining said illumination slit comprises:



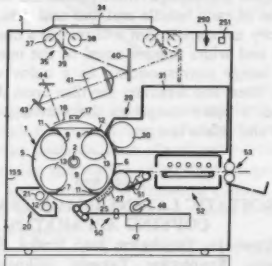
a first member arranged along said optical path between said lens and said object plane, said first member including a first boundary portion for defining a first part of said desired slit profile; and
a second member arranged along said optical path between said lens and said image plane, said second member including a second boundary portion for defining a second part of said desired slit profile different from said first part;
whereby said first boundary of said first member as projected and said second boundary of said second member combine to define said desired slit profile.

4,057,343

ELECTROSTATIC COPYING MACHINE WITH MULTI-FRAME DRUM ASSEMBLY

Piero Gontero, Bollengo (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Italy

Filed Oct. 7, 1976, Ser. No. 730,565
Claims priority, application Italy, Oct. 9, 1975, 69515/75
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—16 **8 Claims**



1. An electrophotographic copying machine comprising:
a photoconductor drum assembly having:
A rotary member mounted to the machine frame for rotation about an axis,
a plurality of sector members. each having an arcuate support surface constituting part of the cylindrical periphery of the drum, each of said sector members being mounted on said rotary member, slidable in a direction perpendicular to the said axis between a first position in which it defines the respective part of the cylindrical periphery of the drum, and a second position

into which it is shifted radially outward with respect to the remainder of the cylindrical periphery,

a photoconductive element carried by each of said sector members, each photoconductive element comprising a web which extends between a feed station and a take-up station of the associated sector members with an intermediate portion of the web wound around the said support surface,

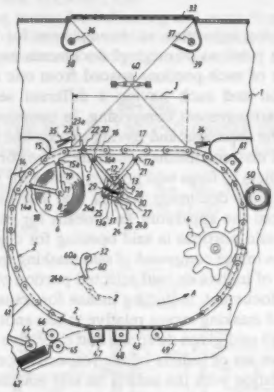
and reversible locking means for maintaining the said sector members in the first position during the rotation of the drum about the said axis.

4,057,344

ELECTRO-PHOTOGRAPHIC COPIER WITH STRIP-SHAPED LATENT-IMAGE CARRIER

Richard Wick, Munich; Josef Pfeifer, Unterhaching, and Günther Schnall, Eching, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 22, 1976, Ser. No. 669,295
Claims priority, application Germany, Mar. 27, 1975, 2513825
Int. Cl.² G03G *15/00*
U.S. Cl. 355—16 **9 Claims**



1. In an electrophotographic copier, a combination comprising pay-out mezns for paying out a convoluted strip-shaped latent-image carrier; take-up means for taking up said carrier as the same is withdrawn from said pay-out means; an image-forming station for forming an image of an original to be copied on said image-carrier; and guide means for guiding said image carrier from said pay-out means to said take-up means in a path which includes at least adjacent said station a planar path portion wherein successive image-receiving increments of said image carrier travel past said station in substantially planar condition, said guide means comprising an articulated chain of support elements supporting said image carrier and having a width at least equal to the width of said image carrier, and guide elements laterally engaging and guiding said support elements.

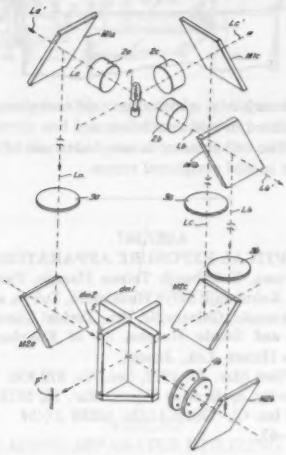
4,057,345

ADDITIVE LAMPHOUSE

Franz F. Ehrenhaft, Forest Hills, and Seymour Rosin, Massapequa Park, both of N.Y., assignors to Anamorphic Ltd., Forest Hills, N.Y.

Filed Sept. 9, 1976, Ser. No. 722,419
Int. Cl.² G03B *27/76*
U.S. Cl. 355—35 **7 Claims**

1. An arrangement for providing color compensated light, comprising, in combination, a single filament light source; means for deriving from the single filament light source three component beams and for transmitting those beams along three optical paths, including three light take-off means located at three different sides of the light source; and means located in the three optical paths for attenuating the three component beams independently of one another, for coloring the three beams in the primary colors red, blue and green and for recombining the beams into a single beam of color compensated light, the means for attenuating, coloring and recombining comprising three attenuating means and a coloring means for coloring the three component beams in respective ones of the three primary colors red, green and blue, each of the three optical paths including one of the three attenuating means, with the attenuating means being located up-path of the coloring means, the coloring means being an optical element which both colors the three component beams in respective ones of the three primary colors red, green and blue and recombines the thusly colored component beams to form the single beam of color



corrected light, the three optical paths at the portions thereof down-path of the three attenuating means extending in respective ones of three different directions, the first and second directions being opposite to each other, and the third direction being perpendicular to the first and second directions, the optical element being comprised of two dichroic mirrors, the two dichroic mirrors intersecting each other at an angle of 90°, each dichroic mirror standing in a plane which is oriented at an angle of 45° to each of said first, second and third directions, one dichroic mirror transmitting only light of a first one of the three primary colors red, blue and green, the other dichroic mirror transmitting only light of a different second one of the three primary colors red, blue and green, the portions of the three optical paths located down-path of said optical element being coincident with one another.

4,057,346

AUTOMATIC FILM TRANSPORTER

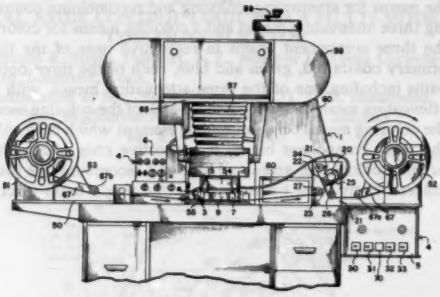
Walter Ellingham, 516 Lincoln Ave., Staten Island, N.Y. 10306, and Edward J. Nolan, 402 Davis Ave., Staten Island, N.Y. 10310

Filed June 16, 1976, Ser. No. 697,082
Int. Cl.² G03B *27/52, 27/32*
U.S. Cl. 355—41 **10 Claims**

1. In a machine for transporting and printing a film track constituting a plurality of individual film negatives and corresponding perforated holes, and having the film track on a take-up reel and supply reel and extending therebetween to a printer, the latter including a light source lens and a screen for printing film on a printing stock, and a bezel plate having an opening substantially equal in size to that of a negative, the improvement comprising:

a yoke having two projecting arms and therebetween a

substantially semicircular inwardly directed peripheral recess and forming two openings disposed rearwardly adjacent the arms, two posts attached to and extending upwardly from said bezel plate;



said yoke detachably mounted on said two posts, the latter being inserted in said two holes; and

a photoelectric cell detector connected to one of the arms of said yoke in said peripheral recess.

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OPTICAL EXPOSURE APPARATUS

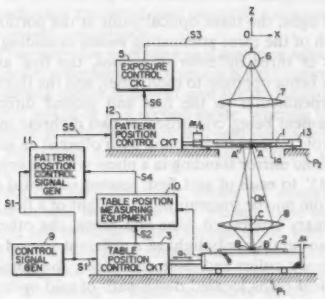
Shigeo Moriyama, Kokubunji; Tatsuo Harada, Fuchu; Yoshio Kawamura, Kokubunji; Seiya Hashimoto, Tokyo, all of Japan; Akihiro Takanashi, Gainesville, Fla.; Toshiei Kurosaki, Shinji Kuniyoshi, and Sumio Hosaka, all of Kokubunji, Japan, assignors to Hitach, Ltd., Japan

Filed Mar. 26, 1976, Ser. No. 670,830

Claims priority, application Japan, Mar. 26, 1975, 50-35581

Int. Cl.[2] G01B *11/26*; G03B *27/54*

U.S. Cl. 355—67 **5 Claims**



1. An optical exposure apparatus for exposing a workpiece to a reduced light pattern obtained from an original pattern through a projective lens having a reduction ratio smaller than one, comprising:

first means for generating a first control signal and for positioning the workpiece at a predetermined position in accordance with said first control signal;

second means for detecting an error in the actual positioning of the workpiece relative to the position represented by the first control signal generated by said first means and generating an error signal representative of said error; and

third means, responsive to the error signal generated by said second means, representative of the error of positioning of the workpiece, for generating a second control signal and for automatically shifting the original pattern in accordance with said second control signal, so as to cancel the error.

4,057,348

COPYING APPARATUS

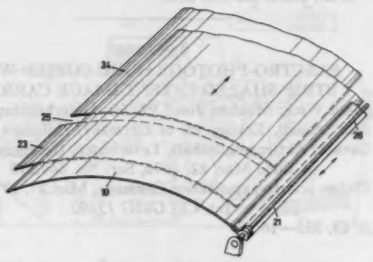
Gerhard Ritzerfeld, Schorlemer Allee 14, 100 Berlin 33, Germany

Filed July 3, 1975, Ser. No. 592,846

Claims priority, application Germany, July 4, 1974, 2432424; Feb. 13, 1975, 2506127

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **19 Claims**



1. In a copying apparatus, an arrangement for forming images including portions of original documents each of which has a plurality of such portions spaced from one another in a given direction and each having a different set of indicia thereon, said arrangement comprising, in combination, masking means at the apparatus and having at least one opening and indicia on said masking means which are to be correlated with said sets of indicia to form said images; means for supporting a respective original document behind said masking means as considered from the apparatus; and means for exposing a selected one of said portions in said opening for copying by the apparatus of an image composed of said masking means and the respective set of indicia on said selected portion of the respective original document, including means for transporting said supporting and masking means relative to one another in a path coincident with said given direction and operative for bringing each respective set of indicia of the respective original document in correlation with the indicia on said masking means for joint copying by the apparatus.

4,057,349

SPECTROSCOPIC TEMPERATURE MEASUREMENT

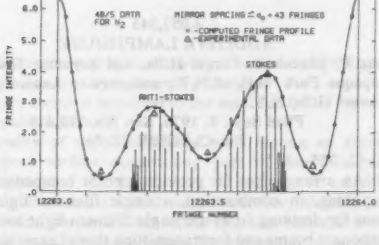
Joseph J. Barrett, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 584,085, June 5, 1975, Pat. No. 4,018,529, which is a continuation-in-part of Ser. No. 478,405, June 11, 1974, Pat. No. 3,909,132. This application Aug. 31, 1976, Ser. No. 719,474

The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.

Int. Cl.[2] G01J *5/60, 3/44*

U.S. Cl. 356—45 **17 Claims**



1. Apparatus for determining the temperature of a gaseous

material by analyzing light having spectral components periodic in frequency, comprising:

a. light conditioning means for collecting, collimating and transmitting said light;

b. interferometric means adapted to receive said light for selectively separating periodic spectra therefrom and transmitting said spectra in the form of a detectable signal, said interferometric means having interference-producing means for providing a plurality of transmission windows regularly spaced in frequency, the frequency spacing between adjacent windows being adjusted to depart from an odd integral submultiple, *n*, of the frequency difference between adjacent spectral components of the periodic spectrum of said gaseous material, said odd integral submultiple being at least three so as to produce a split-fringe containing first and second branches of the components, and scanning means for causing the transmission peaks for adjacent *n*th orders to substantially coincide with the spectral lines of either branch of the components, whereby each branch of said split-fringe is derived from a plurality of periodic spectral lines and has an integrated intensity substantially equal to their sum;

c. signal conditioning means for measuring the intensity of each of said branches; and

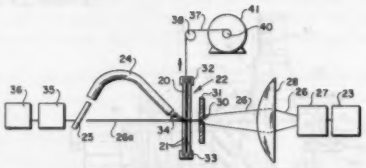
d. detecting means for indicating and recording the intensity ratio of the branches, said intensity ratio correlating with the temperature of said gaseous material.

4,057,350

APPARATUS FOR COUNTING CRIMP IN FIBERS

Jeffrey M. Craig, Princeton, N.J., assignor to Akzona Incorporated, Asheville, N.C.

Filed Aug. 24, 1976, Ser. No. 717,736
Int. Cl.² G01N *23/20*
U.S. Cl. 356—199 **10 Claims**



1. An apparatus for counting crimps in a unit length of a fiber, comprising means for generating a laser beam, a plate having a slit through which the laser beam is passed, a cell to hold the fiber in a fixed position, means for moving the cell transversely through the laser beam lengthwise of the fiber, means for conducting pulses from scattered radiation caused by crimps in the fiber being moved through the laser beam, means for converting pulses from scattered radiation to electrical pulses, and means for counting electrical pulses, whereby as the fiber is moved transversely through the laser beam, pulses from scattered radiation caused by fiber crimps are conducted to the converting means, converted to electrical pulses, and counted, thereby counting the crimps in the fiber.

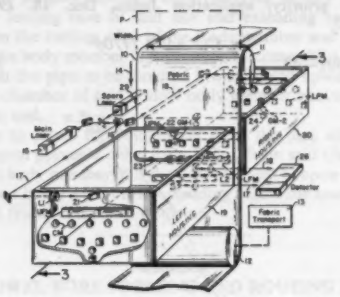
4,057,351

COHERENT SCANNING SYSTEM FOR FABRIC INSPECTION

Sergei Michael Fomenko, Woodland Hills, Calif., assignor to Greenwood Mills, Inc., Greenwood, S.C.

Filed Feb. 23, 1976, Ser. No. 660,253
Int. Cl.² G01N *21/16*
U.S. Cl. 356—238 **10 Claims**

3. A system according to claim 1, in which said plurality of first optical means includes a row of plane mirrors in side-by-side relationship positioned to successively receive light from said scanning mirror and a row of concave mirrors positioned to respectively receive light succesively reflected from said plane mirrors and successively direct said light in said side-by-side parallel directions towards said fabric, said plurality of second optical means including a row of plane mirrors in



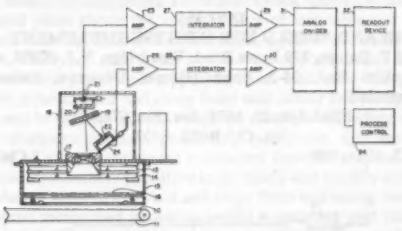
side-by-side relationship respectively in alignment with said concave mirrors and oriented to successively reflect said light beam received from said concave mirrors to said de-scanning mirror.

4,057,352

COLOR GRADING APPARATUS UTILIZING INFRARED LIGHT SOURCE

Raymond E. Babb, Fremont, Calif., assignor to Genevieve I. Hanscom; Robert M. Magnuson and Lois J. Thomson, Calif., part interest to each

Filed May 13, 1976, Ser. No. 686,021
Int. Cl.² G01J *3/50*; G01N *21/22*
U.S. Cl. 356—178 **3 Claims**



1. Apparatus for monitoring the color of a product, comprising in combination:

an Argon gas discharge light source for emitting infrared energy in the frequency region of 8110 A;

a light source for emitting light in the green wavelength region of approximately 5430 A;

means for directing the light from the Argon and green light sources onto the product;

light transmitting means for receiving the light reflected from said product; and

means for generating a ratio signal responsive to the relative intensities of the infrared and green light reflected from the product.

4,057,353

FLOOR CLEANING DEVICE

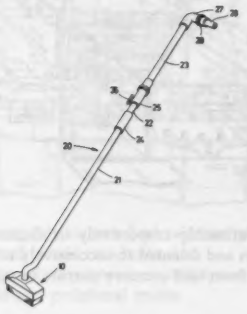
Tatsuyuki Kitatani, No. 867, Fukuda, Sakai, Osaka, Japan

Filed May 11, 1976, Ser. No. 685,164

Claims priority, application Japan, Dec. 18, 1975, 50-172962[U]

Int. Cl.² A46B *11/06*

U.S. Cl. 401—43 **5 Claims**



1. A floor cleaning device connected to a water supply by a hose, comprising:

a hollow pipe handle connected at one end to said hose;

a partition at a midway portion of said pipe handle dividing said pipe into two flow passages;

flap means positioned at said partition and pivotable back and forth on both sides of said partition for alternatively closing off one of said flow passages in said pipe;

pipe means connected to said flap means and extending through said hollow pipe in a water-tight relationship for pivoting said flap means back and forth across said passages;

a screen stretched across the downstream end of one of said flow passages at said partition; and

polishing means removably connected to the end of said hollow pipe handle opposite the end connected to said hose for cleaning the floor surface to be cleaned, said polishing means having a plurality of holes therethrough communicating with said hollow pipe, whereby water in said pipe will pass through said holes.

4,057,354

NIB AND SHIELD FOR WRITING IMPLEMENT

Harold F. Bajusz, 379 Innes Road, Woodridge, N.J. 07075, and Nobuhiro Iino, 94-2, Shimo-Hideya, Okegawa, Saitama, Japan (363)

Filed Apr. 21, 1976, Ser. No. 678,747

Int. Cl.² B43K *5/00*

U.S. Cl. 401—199 **2 Claims**

1. A writing implement comprising an elongated barrel having an opening at one end, means within said barrel defining an ink reservoir spaced from said one end, said barrel having side walls located between said ink reservoir and said one barrel and defining an elongated chamber therebetween, an elongated flexible nib having a writing point at one end and a tip at its opposite end, a shield encasing said nib and terminating at one end short of said one nib end to expose the writing point at the one shield end, said nib and said shield being coaxially inserted into the opening at one end of said barrel with the tip of said nib lying in communication with said ink reservoir for transmitting ink from said ink reservoir along said nib to said writing point, said shield extending within said chamber and being spaced from the side walls thereof, said shield extending from said one shield end over the major portion of the length of said nib for reinforcing said nib against flexing movement within said chamber in a direction transverse to its length, and means for retaining said nib and said shield in said barrel, said nib and shield being formed of different plastic materials coextruded one with the other, said shield being formed of a plastic material stronger than the plastic material forming said nib, said shield lying in continuous engagement with said nib substantially throughout the portion of said nib which is coextensive with said shield, said shield encasing said nib for at least 70% of the length of said nib and having a laterally enlarged portion at said one end thereof forming a shoulder engaging the margins of the barrel about said opening when said shield and said nib are inserted into and retained within said barrel, said shield being cylindrical in cross section and being substantially constant in cylindrical cross section for the portion of its length within said chamber and barrel opening said shield having a reduced diameter portion adjacent its opposite end tapering toward the tip of said nib and terminating short of said tip, said ink reservoir including an ink saturated fiber wad, said shield terminating at its opposite end short of the tip of said nib, said tip being received within said fiber wad and exposed laterally for communication with the ink in said reservoir.

4,057,355

FRANGIBLE TIE ROD END BEARING SEAT

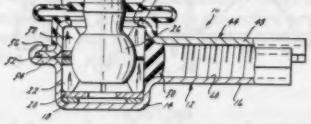
William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 593,810, July 7, 1975, Pat. No. 3,988,818.

This application July 2, 1976, Ser. No. 702,381

Int. Cl.² F16D *9/00*

U.S. Cl. 403—2 **1 Claim**



1. A bearing for a preloaded ball and socket joint having a generally annular shape with a partially spherical bearing surface,

said bearing having a plurality of circumferentially spaced apart radial slots dividing said bearing into a plurality of bearing segments,

frangible tie bars interconnecting said bearing segments,

said tie bars having sufficient strength to maintain said bearing as a single piece during normal handling and being fracturable when assembled into said preloaded ball and socket joint whereby said bearing forms a plurality of separate bearing elements.

4,057,356

GLUED CORNER-JOINTS

Richard Bent Nissen, Langa, Denmark (8870)

Filed Nov. 6, 1975, Ser. No. 629,219

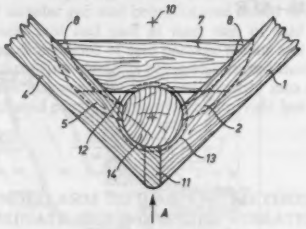
Claims priority, application Denmark, Nov. 7, 1974, 5801/74; Apr. 21, 1975, 1700/75

Int. Cl.² F16B *12/46*

U.S. Cl. 403—219 **17 Claims**

5. A corner joint comprising a pair of elongated, angularly related, elements arranged to form part of the corner joint, a block connecting said pair of elements along the inside of said corner joint and lying in a plane formed by said angularly

related elements, the adjoining surfaces of the block and the respective elements each being provided with and interconnected by tongues and grooves, the tongues and grooves of each said surface having outer tips and bases respectively which lie coincident with segments of circles having a common axis perpendicular to the plane of the elements in the



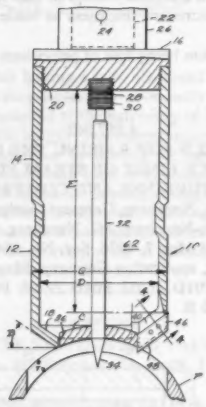
corner joint, the segments of the circles defined by the outer tips and bases of the tongues and grooves of the adjoining surface of one element having a common axis with the segments of the circles defined by the outer tips and bases of the tongues and grooves of the adjoining surface of the other of said elements.

4,057,357

CHIPLESS SHELL CUTTER FOR LARGE DIAMETER PLASTIC PIPE

Joseph L. Daghe, Decatur, and Casimir B. Kuzmicki, Chicago, both of Ill., assignors to Mueller Co., Decatur, Ill.

Filed Nov. 24, 1975, Ser. No. 634,753
Int. Cl.² B23B *41/08, 51/04*
U.S. Cl. 408—67 **23 Claims**



1. A rotatable shell cutter member for cutting a hole in large diameter plastic pipe by cutting a coupon to form a hole and enlarging the formed hole when the shell cutter member is positively advanced against the pipe a predetermined distance per rotation of the same, said shell cutter member comprising:

a metal hollow body member closed at one end and open at its other end to define a chamber for chips cut from said pipe, said body member having a cylindrical portion terminating at the said other end in a frusto-conical end portion;

a generally lengthwise extending slot in the frusto-conical end portion, said slot having a leading face and a trailing face as defined by direction of rotation of the shell cutter member;

a blade member on said trailing face of said slot and spaced from the leading face, said blade member having a cutting edge positioned beyond the frusto-conical end portion of said body member and being generally parallel to said frusto-conical end portion of said body member, said blade member having a chip receiving surface opposing the leading face of said slot and extending rearwardly from the cutting edge of the blade member and inwardly of the body member in a direction to cause chips removed from the pipe to be directed inwardly and upwardly into the chamber of said hollow body member above the coupon; and,

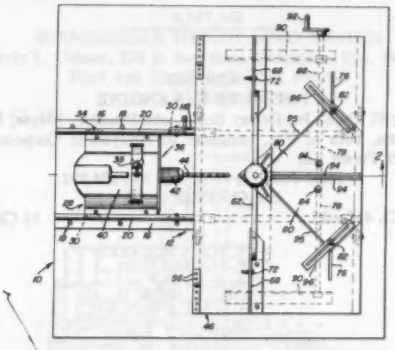
means to retain the coupon cut from the pipe so that the coupon prevents chips from falling from said chamber of said body member into the hole cut, said coupon retaining means being a pilot drill extending below the lower end of said frusto-conical end portion.

4,057,358

DOWEL BORE FORMING AND ROUTING JIG

Kenneth M. Young, 1601 Ave. J, Cozad, Nebr. 69130

Filed Nov. 3, 1975, Ser. No. 628,607
Int. Cl.² B23B *41/00*
U.S. Cl. 408—91 **4 Claims**



1. In combination, a support table defining a center line, a support member, support means supporting said support member for guided rectilinear reciprocation toward and away from one side of said table in a plane normal to said table and in which said center line is disposed, said support member including means for supporting a rotatable chuck therefrom disposed in said plane above the upper surface of said table and facing toward the opposite side of said table, a pair of abutment members overlying said upper surface on opposite sides of said center line plane and supported from said table for guided movement toward and away from said center line along paths normal to said plane, said abutment members including opposing abutment surfaces paralleling said plane, and abutment member adjustment means connected between said table and abutment members operative to inversely and equally shift said abutment members toward and away from said center line, said support means also including means supporting said table for guided rectilinear shifting along a path normal to said plane relative to the latter and operative to establish equal adjusted predetermined limits of movement of said table along the last mentioned path and thus said center line outwardly of opposite sides of said plane.

4,057,359

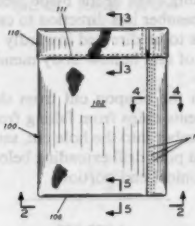
BALLISTIC NYLON FABRIC TURBINE GOVERNOR HOUSING SHIELDING MEANS

Edward D. Grooman, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 22, 1975, Ser. No. 643,607
Int. Cl.² B23B *39/04*
U.S. Cl. 415—9 **4 Claims**

1. A removable lightweight shielding means of ballistic

nylon to provide added protection to a turbine governor housing, comprising: a first plurality of layers of ballistic nylon fabric forming a continuous sidewall and a second plurality of ballistic nylon fabric layers fitted and secured around an open



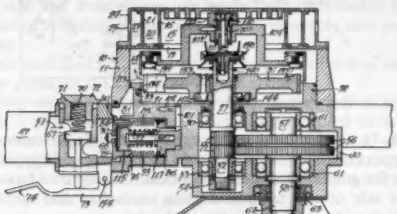
end of said continuous sidewall so as to form a closed end of said shielding means, said shielding means locatable over a turbine housing cover and securable to said housing by a removable means.

4,057,360

PRESSURE GAS ENGINE

James V. Theis, Jr., Delray Beach, and Bruno P. Meyer, Boca Raton, both of Fla., assignors to Hollymatic Corporation, Park Forest, Ill.

Filed June 10, 1976, Ser. No. 694,892
Int. Cl.[2] F01B *25/06*
U.S. Cl. 415—25 **14 Claims**



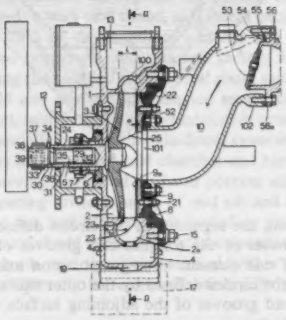
1. A pressure gas engine, comprising: a rotor having energy conversion means thereon for converting dynamic gas pressure to power; gas supply means for supplying pressurized gas to said engine; gas passage means from said supply means to said energy conversion means; control means for said pressurized gas comprising a valve seat in said gas passage and a force movable valve movable toward and away from said seat to control and meter the gas flow through said passage, said force movable valve comprising an expansible and retractable bellows having a hollow interior and a chamber surrounding the bellows in which the bellows is located; first gas flow means for diverting a portion of said pressurized gas to the interior of said bellows; second gas flow means for diverting a portion of said pressurized gas to the chamber surrounding said bellows; a pressurized gas vent passage means leading from said bellows interior and including a vent valve seat; a movable vent valve member movable into and away from engagement with said vent valve seat for metering gas flow through said vent passage; and means for moving said vent valve member toward said vent valve seat on increasing speeds of said rotor and away from said vent valve seat on decreasing speeds thereby controlling the rate of venting of said gas and thus the position of said force movable valve relative to its seat.

4,057,361

CENTRIFUGAL PUMP

Georges Renaud, Nogent sur Marne, France, assignor to Societe Pompes Multiflux, Paris, France

Filed Mar. 11, 1975, Ser. No. 557,385
Claims priority, application France, Mar. 11, 1974, 74.08213
Int. Cl.[2] F04D *5/00*; F01D *17/00*
U.S. Cl. 415—53 R **9 Claims**



1. In a single stage centrifugal pump having a casing enclosing a cavity housing an axial suction impeller, said impeller being cantilevered to a drive shaft and laterally displaceable, and said cavity including an enlarged peripheral volute portion, the improvement wherein

said cavity is constructed to receive impellers having blades whose widths vary over a predetermined range,

the outside circumference of the impeller has a width which covers substantially the entire opening of said volute portion for all different widths of said range and the rear shroud has increased thickness as blade width decreases, and

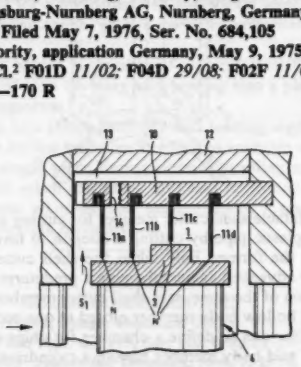
the volute portion being free of provisions for adjustment of its width.

4,057,362

APPARATUS FOR RAISING THE DYNAMIC PERFORMANCE LIMIT OF STEAM FLOW AND GAS FLOW TURBINES AND COMPRESSORS

Rudolf Schwaebel, Nurnberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Nurnberg, Germany

Filed May 7, 1976, Ser. No. 684,105
Claims priority, application Germany, May 9, 1975, 2520653
Int. Cl.[2] F01D *11/02*; F04D *29/08*; F02F *11/00*
U.S. Cl. 415—170 R **4 Claims**



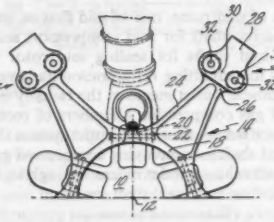
1. An apparatus for use in connection with reduction of vibration exciting forces to effect raising of dynamic performance limit of flow in a rotary machine of the turbine and compressor type having a leakage flow, the combination of: rotatable means, stationary wall means in the form of a ring surrounding said rotatable means in radially spaced relationship

thereto so as to define therewith an annular clearance, non-contacting sealing means arranged in said clearance and supported by said ring while forming a labyrinth seal including throttling elements, housing means surrounding said ring in radially spaced relationship so as to form therewith an annular gap, said labyrinth seal including an active section and at least one throttling element the improvement comprising that said ring provided with passage means extending from said clearance to said annular gap and being located ahead of said active section of said seal and past at least one of said throttling elements, the dimensions of said passage means and of at least one of said throttling elements being so selected that the major portion of the leakage flow is passed directly into said clearance through said passage means which provide less resistance to flow.

4,057,363
EXTENDED ARM BIFILAR AND METHOD TO ELIMINATE SECOND ORDER VIBRATION EXCITATION

Irwin Jeffrey Kenigsberg, and William Francis Paul, both of Trumbull, Conn.. assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 20, 1975, Ser. No. 633,886
Int. Cl.² B64C *27/32*
U.S. Cl. 416—145 **6 Claims**

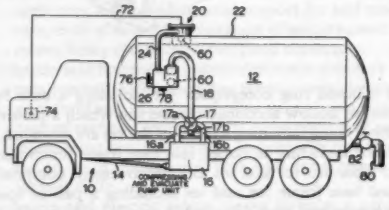


1. In a helicopter having a hub, a support member rotatable with said hub having a plurality of radially extended arms, a bifilar absorber mounted at the extremity of each arm having a pendulous mass, the length of said arms measured from the axis of rotation of said rotor to the c.g. of said masses and the weight of said masses being such as to absorb input excitations at design forward speed at pendulum amplitude of approximately ± 30°, that improvement comprising the combination of said pendulous masses having the same weight with new radially extended supporting arms of substantially double the length of said first mentioned arms.

4,057,364
FLUID TRANSFER SYSTEMS AND VALVES THEREFOR

John Bratschitsch, 210 Edgemont St. South, Hamilton, Ontario, Canada

Division of Ser. No. 499,877, Aug. 23, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,318
Int. Cl.² F04B *49/00*
U.S. Cl. 417—34 **7 Claims**



1. A fluid transfer system for transferring liquid from a source thereof to the interior of a liquid-receiving tank by the withdrawal of air from the said interior and for transferring liquid from the tank interior to the exterior thereof by the supply of air to the said interior comprising:

an air transfer pump unit for the said withdrawal of and supply of air;

an air transfer passage connecting the interior of the tank to the air transfer pump unit;

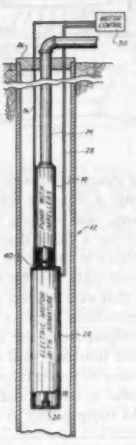
a first float responsive means positioned at least partly in the tank interior and actuated in response to the presence of a predetermined level of liquid in the tank interior to close the air transfer passage and thereby preclude the passage of liquid into the air transfer passage;

and a secondary float valve means connected in the air transfer passage between the said air pump unit and the said first float responsive means and actuated in response to receipt of liquid from the air transfer passage between the first float responsive means and itself to close the air transfer passage and thereby to further preclude the possibility of passage of liquid from the tank interior to the air transfer pump unit.

4,057,365
SUBMERSIBLE THRUST LIMIT SWITCH

Marvin L. Colmer, 530 S. Berkshire, Crosbyton, Tex. 79322

Filed Apr. 12, 1976, Ser. No. 676,368
Int. Cl.² F04B *49/06*
U.S. Cl. 417—44 **10 Claims**



1. In a submersible pump unit having

a. a submersible electric motor enclosed in a motor housing,

b. a vertically oriented motor shaft extending from said motor,

c. fluid seals around said motor shaft and all other openings to prevent fluid from entering the motor so the motor may be operated submerged in water,

d. a source of electrical power,

e. a normally opened switch connecting said motor to said source of power,

f. an electric holding coil to hold said switch closed when energized,

g. a pump attached to said motor,

h. a pump shaft extending from said pump coaxial with said motor shaft,

j. a thrust bearing supporting the motor shaft and pump shaft, and

k. a coupling connecting said pump and motor shaft;

m. the improvement comprising

n. a submersible thrust limit switch affixed to said motor housing and bearing against said coupling, forming

o. detection means for detecting axial movement of said shafts, and

p. conductor means on said thrust limit switch for connecting it to the electrical power supply,

q. said switch including

i. a cavity, and

ii. a flexible diaphragm between the cavity and the outside of the switch whereby the pressure within the switch is equal to the pressure outside the switch.

4,057,366

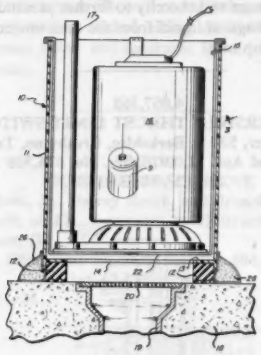
PORTABLE WATER EVACUATOR

Fred T. Niemann, 19 N. Mount Prospect, DesPlaines, Ill. 60016

Filed Feb. 2, 1976, Ser. No. 654,540

Int. Cl.[2] F04B *21/00, 35/04*

U.S. Cl. 417—234 **6 Claims**



1. A portable water evacuator assembly comprising, in combination: a sump pump; a housing for removably supporting therein said sump pump, said housing being formed to removably seat over and about a floor drain and having a sealing gasket about its periphery at the lower end thereof for providing a substantially water-tight seal between said housing and a support surface such that said sealing gasket seals off the area exterior to the area immediately above the floor drain and such that any water discharged from the floor drain is contained within and rises in said housing; said sump pump being actuated by means responsive to water rising within said housing to pump water out of said housing; and means for discharging water pumped by said sump pump to a remote location.

4,057,367

COMBINED ROTARY-RECIPROCATING PISTON COMPRESSOR

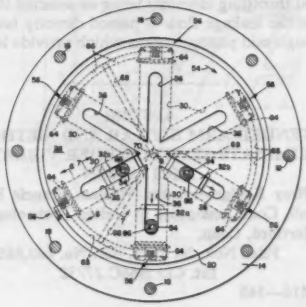
James S. Moe, 514 W. Fireweed Lane, Anchorage, Alaska 99503; Marvin B. Carter, and Ray L. Carter, both of Star Route C Box 293, Palmer, Alaska 99645

Filed Dec. 11, 1975, Ser. No. 639,822

Int. Cl.[2] F04B *27/06*

U.S. Cl. 417—273 **11 Claims**

1. A compressor for refrigeration gas or the like comprising: a stator housing; a rotor having an axis and being mounted for rotation about said axis within said stator housing; means defining an even numbered plurality of similarly internally dimensioned and equispaced gas compression chambers within said rotor, arranged about and intersecting said rotor axis, opposed pairs of said compression chambers forming a single expansible chamber having a single centerline, said centerline being a diameter of said rotor at a right angle to said rotor axis, a plurality of similarly externally dimensioned pistons, one in each expansible chamber; each expansible chamber piston being linearly moveable through substantially the entire length of its chamber, through said rotor axis, a plurality of connecting pins, one on each piston; rotatable plate means for mounting the free ends of said connecting pins and being disposed within said housing on one side of said rotor, the axis of rotation of said plate means being parallel to and offset a predetermined distance from said rotor axis; a first shaft extending from said plate means through said housing on the axis of rotation of said plate means; a second shaft extending from said rotor on a side thereof opposite said one axis through said housing on the



axis of rotation of said rotor, one of said first or second shafts constituting a drive shaft for said compressor; sealing means about each of said shafts for sealing said rotor within said housing; means for admitting refrigeration gas to each of said expansible chambers; outlet means at the radially outward end of each of said gas compression chambers of receiving compressed gas; duct means from said outlet means through said rotor and second shaft for conveying compressed gas from said outlet means; and exhaust outlet means through said housing in fluid communication with said duct means.

4,057,368

BASE FRAME CONSTRUCTION FOR A LIQUID RING COMPRESSOR SET

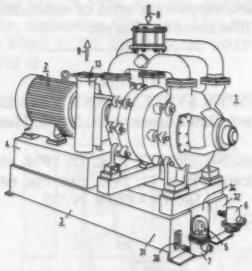
Heinz Balling, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 15, 1975, Ser. No. 640,959

Claims priority, application Germany, Dec. 19, 1974, 2460268

Int. Cl.[2] F04B *39/16*; F04C *19/00*

U.S. Cl. 417—313 **10 Claims**



1. In a liquid ring compressor set including a base frame fabricated of hollow sectional members in which a motor and compressor, each including a shaft, of the set are mounted, said compressor including an outlet, said base frame functioning as a liquid separator for said set, the improvement comprising a U-shaped base frame for said set including a pair of spaced-apart leg members each disposed in parallel relationship with respect to the shaft of said compressor of said set, and a connecting member coupled to corresponding ends of said leg

members so as to form said U-shaped base frame, one of said leg members including at least one fluid inlet opening disposed in the top surface thereof coupled to said compressor outlet and the other of said leg members including at least one fluid outlet opening disposed in the top surface thereof, said compressor ejecting a fluid mixture into said inlet opening and said fluid mixture flowing through said base frame out of said compressor set through said outlet opening for separating moisture from said fluid mixture.

4,057,369

VACUUM PUMP HAVING A ROTOR SUPPORTED IN THE INTERIOR OF ITS CASING

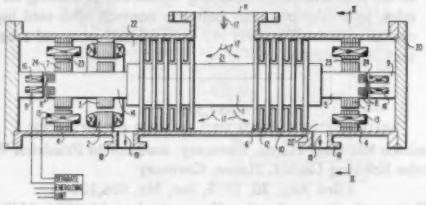
Gerhard Isenberg, Dachau, and Wolfgang Tuzinsky, Munich, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Munich, Germany

Filed July 22, 1974, Ser. No. 490,849

Claims priority, application Germany, July 21, 1973, 2337226

Int. Cl.² F04B *17/00*

U.S. Cl. 417—365 **15 Claims**



1. A vacuum pump for generating high vacuums free of lubricating vapors, said pump comprising:

a housing having a horizontal extent, said housing including a vacuum intake chamber and at least one outlet means,

a rotor structure supported horizontally along the horizontal extent of said housing, said rotor structure including a shaft and a plurality of rotor vanes mounted on said shaft, said plurality of rotor vanes being in cooperation with a plurality of stator vanes mounted in said housing, and said plurality of rotor and stator vanes being arranged between said intake chamber and said outlet means,

an electric motor means mounted in said housing for rotation said rotor structure, and

electromagnetic support means for rotatably supporting said rotor structure in said housing, said electromagnetic support means supporting said rotor structure both axially and radially,

wherein said electromagnetic support means includes a plurality of radially mounted magnetic cores on said shaft and a plurality of electromagnets mounted in said housing in operative relationship with said plurality of radial magnetic cores for providing radial support of said rotor structure,

wherein said electromagnetic support means further includes at least one axial magnetic core mounted on the end face of said shaft and at least one electromagnet mounted in said housing in operative relationship to said axial magnetic core for providing axial support for said rotor structure, each of said electromagnets of said magnetic support means being electrically energized separately;

wherein said horizontally supported rotor structure includes two journal shafts extending from a central rotor hub, a portion of said plurality of rotor vanes being mounted on each of said two journal shafts and a portion of said stator vanes being mounted in said horizontally extending housing to be in cooperation with said rotor vanes on each journal shaft;

wherein said electric motor means includes a rotor means and a stator means, said rotor means being mounted on one of said two journal shafts, and said stator means being mounted in said housing in operative relationship to said rotor means; and

wherein said plurality of radially mounted magnetic cores includes two annular, laminated magnetic cores, each of said annular cores being mounted on each of said two journal shafts, and said plurality of electromagnets is mounted in said housing in operative relationship to each of said annular magnetic cores, and wherein said at least one axial magnetic core is mounted within the end face of each journal shaft and said at least one electromagnet is mounted in said housing in operative relationship to said axial magnetic cores in each respective end face of said journal shafts.

4,057,370

ELECTRIC BLOWER ASSEMBLY

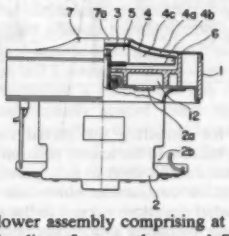
Shigeaki Numata, and Ryosuke Sasaoka, both of Yokaichi, Japan, assignors to Matsushita Electric Industrial Co., Ltd, Kadoma, Japan

Filed Jan. 5, 1976, Ser. No. 646,593

Claims priority, application Japan, Feb. 4, 1975, 50-15181; Feb. 6, 1975, 50-16015; Feb. 6, 1975, 50-16017; Feb. 27, 1975, 50-24807

Int. Cl.² F04B *17/00*; F04D *29/66*

U.S. Cl. 417—366 **3 Claims**



1. An electric blower assembly comprising at least one impeller having a plurality of vanes thereon defining exhaust outlets therebetween, an electric motor on which said impeller is mounted for rotation of said impeller, a plurality of volute chambers which are disposed peripherally around and on the plane of rotation of said impeller and each of which is defined by wall portions disposed parallel to and on opposite sides of said plane of rotation of said impeller, by a main wall disposed between said wall portions and perpendicular to said plane of rotation and extending in a curve having an inner end which is closer to said impeller and an outer end which is further removed from said impeller, and by a wall extension which in each volute chamber extends in direct continuation from the inner end of the main wall of an adjacent volute chamber and has the upper edge inclined downwardly in a direction opposite the direction of rotation of said impeller, the length of each said wall extension being greater than the distance between adjacent impeller vanes, air distribution passages for direction of air around said motor, whereby said motor may be cooled, and channels which are inclined with respect to said plane of rotation of said impellers and extend between outer end portions of said volute chambers and said air distribution passages.

4,057,371

GAS TURBINE DRIVEN HIGH SPEED CENTRIFUGAL COMPRESSOR UNIT

Karol Pilarczyk, Loudonville, N.Y., assignor to Norwalk-Turbo Inc., Latham, N.Y.

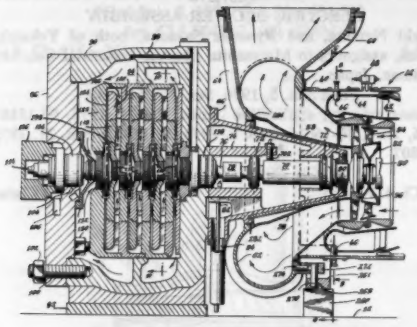
Filed May 3, 1974, Ser. No. 466,877

Int. Cl.² F04B *17/00*; F02C *7/02*

U.S. Cl. 417—409 **9 Claims**

1. A compact high speed centrifugal compressor-gas turbine engine driver unit comprising a high speed centrifugal compressor including a compressor input shaft, a two-shaft gas turbine engine having a gas generator including a rotor shaft

and a power turbine mounted on a power transfer shaft, said gas generator providing combustion products to the power turbine, there being no mechanical connection between the rotor shaft and the power transfer shaft of the gas turbine engine, a partial toroidal-shaped discharge casing in communciation with the power turbine for receiving exhaust gases from the power turbine, the partial toroidal-shaped discharge casing including discharge means for discharging the exhaust gases received by said partial torodial-shaped discharge casing, the compressor input shaft and the power transfer shaft of the gas turbine engine being directly closely integrated with each other, and shaft supporting means mounted to the compressor and extending outwardly therefrom concentric with said compressor input shaft for rotatably receiving said compressor input shaft and said power transfer shaft, and wherein means



are included for mounting the partial torodial-shaped discharge casing relative to the axis of rotation of the compressor shaft and power transfer shaft so as to permit free and uniform heat expansion or contraction movement of the discharge casing in all radial directions normal to the axis of rotation, the mounting means including flex means coupled to the partial toroidal-shaped discharge casing to accomodate expansion and contraction of the partial torodial-shaped casing in the plane of the partial torodial-shaped discharge casing normal to the axis of rotation of the power transfer shaft and vertical movement means permitting vertical movement of the partial toroidal-shaped discharge casing, the flex means and vertical movement means preventing movement of the partial toroidal-shaped discharge casing along its axis of rotation toward the power turbine.

4,057,372

AERATOR

Lawrence E. Johnson, Dana Point, and William W. Conger, IV, Santa Ana, both of Calif., assignors to Lawrence E. Johnson, Dana Point, Calif.

Filed Aug. 25, 1975, Ser. No. 607,299
Int. Cl.² F04B *17/00*
U.S. Cl. 417—424 **13 Claims**

1. An aerator for forcing air into the water of a spa, said aerator comprising

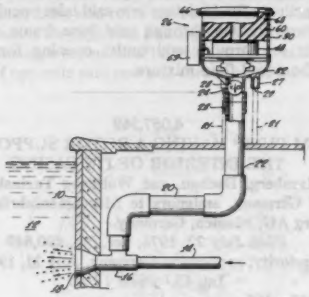
a housing formed of a cylindrical pipe section, a base secured and sealed to the bottom of said pipe section and having an axially directed output fitting connected therewith,

an annular support and sealing ring fixed and sealed to and within said pipe section adjacent said base,

a motor blower unit fixed and sealed to said support ring in axial alignment with said pipe section, said motor blower having an air input on one side of said ring and an air output on the other side of said ring,

a cover connected with the top of said pipe section, and

a muffler mounted in said pipe section and comprising a continuous body of foam substantially completely filling the space between said motor blower unit and an upper edge of said pipe section, said body of foam having an aperture extending axially therethrough of a diameter that is several times less than the diameter of the pipe section, said muffler having a substantially flat input end thereof extending parallel to and spaced from said cover to define



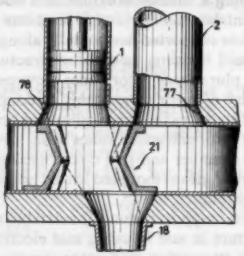
an air inlet chamber including means for providing an air inlet, said inlet chamber being in contact with said input end of said muffler over the entire cross-sectional area of said pipe section.

4,057,373

MULTI-CYLINDER PUMP FOR CONCRETE

Friedrich Schwing, Herne, Germany, assignor to Friedrich Wilhelm Schwing GmbH, Herne, Germany

Filed Aug. 20, 1975, Ser. No. 606,101
Claims priority, application Germany, Aug. 24, 1974, 2440654
Int. Cl.² F04B *7/00*
U.S. Cl. 417—519 **10 Claims**



1. A multi-cylinder piston pump for conveying concrete, comprising two cylinders, a filling chamber casing, a respective inlet opening for each cylinder located in an end wall of the filling chamber casing at approximately equal distances from a vertical plane through the casing, said plane containing a horizontal axis which is the axis of the cylindrical wall of the casing, an outlet opening located in the other end wall, the perpendicular projection of the outlet opening on to the inlet openings partially covering said inlet openings, each cylinder being arranged to alternately suck the material through its respective inlet opening and force the material conveyed through the outlet opening, said pump further comprising a shaft containing said horizontal axis, a pivot body fixed on said shaft acting to deflect the material conveyed in the filling chamber, blades on said pivot body enclosing a pressure channel leading to the outlet opening, each blade having its edges sealed against the casing walls, and a base which is fixed to the shaft, the shape of said pressure channel being formed by the intersection of two pipe segments with the portions of the pipe segments which lie within the channel being eliminated, the line of said intersection being located substantially midway between the two end walls of the filling chamber, complementary surfaces on said pipe segments providing a smooth flow

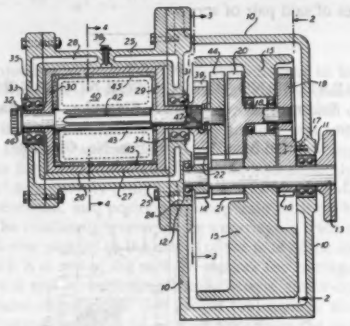
path when said pivot body is in one position only, and conical recesses on said inlet and outlet openings providing a smooth flow from said pressure channel to said openings.

4,057,374

ROTARY INTERNAL COMBUSTION ENGINE WITH UNIFORMLY ROTATING PISTONS COOPERATING WITH REACTION ELEMENTS HAVING A VARYING SPEED OF ROTATION AND OSCILLATING MOTION

Frederick W. Seybold, 1979 Dogwood Drive, Scotch Plains, N.J. 07076

Filed Sept. 2, 1976, Ser. No. 719,998
Int. Cl.[2] F01C 1/00
U.S. Cl. 418—36 8 Claims



1. A rotary internal combustion engine comprising in combination:

a. a first housing having a circular bore, exhaust and intake ports, water cooling cavities and ignition means,

b. two side frames supporting said housing,

c. a hollow cylindrical rotor rotatable in said circular bore, two diametrically opposed wedge-shaped pistons integral with said rotor, and axial, helical slots adjacent to said pistons,

d. side walls on said rotor with first and second hubs thereon for mounting snap-ring bearings held in said side frames, said first hub being serrated

e. a first spur gear mounted on said serrated hub,

f. a multiple-splined shaft journalled in said first and second hubs, one end of said shaft being threaded to receive adjustable locking means, the other, longer serrated end of said shaft mounting a second spur gear,

g. a reactor element having two diametrically opposed, wedge-shaped means integral with a long hub, said hub being splined and mounted on said multiple-splined shaft, and grooves in said reactor elements to receive seals,

h. a second and larger housing, said first housing and side frames being bolted thereto,

i. a drive shaft supported on a first ball bearing held on one side frame and a second ball bearing supported on said second housing,

j. a large flywheel and a pinion being secured on said drive shaft,

k. a stud secured in one side frame on which an idler gear is rotatably mounted, said idler gear meshing with the pinion on said drive shaft and said first spur gear,

l. a compound gear mounted on ball bearings supported on said flywheel, said compound gear comprising a third spur gear and a first elliptic gear,

m. a second elliptic gear secured to said second housing and mating with said first elliptic gear,

n. a second wide-faced pinion free to turn on said drive shaft and mating with said second and third spur gears,

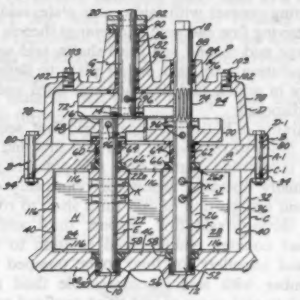
o. whereby, after ignition, the expanding gas causes the reactor element at first to turn in a direction opposite to that of the piston and to exert a useful driving force on the piston as well as on the reactor element.

4,057,375

PUMP STRUCTURE

Paul W. Nachtrieb, 6392 Park Ave., Garden Grove, Calif. 92645

Filed Oct. 22, 1976, Ser. No. 735,026
Int. Cl.[2] F01C 1/18, 21/12; F04C 1/08, 15/02
U.S. Cl. 418—189 9 Claims



1. A semi-positive displacement pump of the type that includes first and second counter rotating impellers situated on spaced parallel axes in a pump chamber that has an inlet for an incompressible fluid and a discharge outlet therefor, with each of said impellers including a cylindrical hub from which a plurality of circumferentially spaced vanes extend radially, said first and second impellers when synchronously rotated sequentially defining first and second confined spaces that force said liquid in said pump chamber from a position adjacent said inlet to said outlet, said first and second impellers as they synchronously rotate defining third confined spaces of variable volume therebetween that pump a portion of said incompressible fluid in said pump chamber from a position adjacent said outlet to said inlet, said pump being characterized by operating smoothly without pulsations and including:

a. first, second and third shafts each of which has first and second end portions, with said first and second hubs engaging said first and second shafts adjacent said first end portions thereof and removably secured thereto;

b. a first gear removably secured to said second end portion of said first shaft;

c. a second gear removably secured to said second shaft intermediate said first and second end portions thereof and in engagement with said first gear;

d. a third gear removably secured to said second end portion of said third shaft;

e. a fourth gear defined on the exterior surface of said second shaft that is engaged by said third gear;

f. a center plate that has first and second spaced openings therein that rotatably engage intermediate portions of said first and second shafts, said center plate having a plurality of spaced transverse first bolt holes adjacent the edge thereof;

g. a first housing that includes a flat bottom and a first continuous side wall that extends upwardly from the latter, said side wall having an oppositely disposed fluid inlet and fluid outlet therein, first and second elongate transverse fluid pressure relief cavities in said bottom adjacent said fluid inlet and outlet, said first and second cavities separated by a first portion of said bottom in which first and second recesses are formed that rotatably engage said first end portions of said first and second shafts, said first side wall on the upper extremity thereof developing into a first outwardly extending flange that has a plurality of spaced second bolt holes therein that are aligned with said first bolt holes, with the surface of said center plate most adja-

cent said first housing having third and fourth pressure relief cavities therein aligned with said first and second cavities, and said first housing when said first flange is in abutting contact with said center plate cooperating with the latter to define said pump chamber in which said first and second impellers are disposed;

h. a second housing that includes a top from which a continuous side wall depends, which side wall develops into an outwardly extending second flange in which a plurality of spaced third bolt holes are defined that are in alignment with said first bolt holes when said second flange is in abutting contact with said center plate, said second housing having first and second openings therein that rotatably engage said second and third shafts, said second housing cooperating with said center plate to define a confined space in which said first, second, third and fourth gears are disposed;

i. a plurality of bolts that engage said first, second and third bolt holes to removably hold said first and second housings in abutting contact with said pressure plate;

j. manually operated means for removably engaging said second end portion of said third shaft to rotate the latter and through said first, second, third and fourth gears impart counter synchronized rotation to said first and second impellers for fluid to be pumped in said pump chamber with said incompressible fluid not imparting shock to said vanes as said third confined spaces decrease in volume due to said fluid flowing into said fluid pressure relief cavities when said incompressible fluid is pressurized in said third confined spaces; and

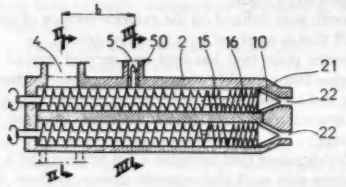
k. engageable means on said second end portion of said second shaft that may be removably engaged by a prime mover to drive said first and second shafts and first and second impellers to pump fluid in the same manner as though said first and second shafts were driven by the manual rotation of said third shaft, with said center plate in cooperation with said first and second housings defining said pump chamber and confined space in which said first, second, third and fourth gears are disposed, said center plate defining said third and fourth fluid pressure relief cavities, and in cooperation with said first and second flanges and bolts holding said first and second housings in fixed spacing relative to one another.

4,057,376

DEVICE FOR DEGASSING PLASTIC MATERIALS

Pierre Berger, Saint-Etienne, France, assignor to Creusot-Loire, Paris, France

Filed July 28, 1976, Ser. No. 709,524
Claims priority, application France, Aug. 1, 1975, 75.24128
Int. Cl.² B29B *1/10*
U.S. Cl. 425—73 **5 Claims**



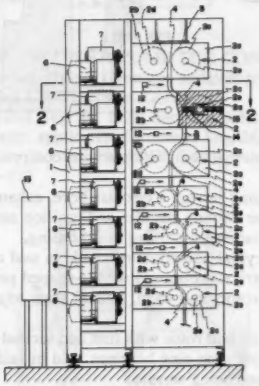
1. A device for degassing plastic material comprising an extruder including at least three parallel screws which intermesh in pairs, a casing surrounding said screws, said casing having opposite ends, a central stem extending axially in said casing and around which said screws are arranged, said casing having inner semi-cylindrical surfaces which surround a portion of the periphery of a respective one of said screws, said central stem having outer semi-cylindrical surfaces surrounding a remaining portion of the periphery of the respective screws such that each screw is substantially enclosed in entirety by said casing and central stem, said casing defining supply orifice means for supplying plastic material to said screws and degassing orifice means operatively associated with a suction source for removing gas from said plastic material, means operatively associated with said screws for rotating said screws in the same direction to feed material from said supply orifice means to one end of said casing, an end plate closing said one end of said casing and defining channel means for removing plastic material from said casing, said degassing orifice means being upstream of said supply orifice means with respect to the direction of feed of plastic material, said degassing orifice means comprising a degassing orifice centered in a plane tangential to each pair of said screws, said degassing orifice having a diameter at least equal to the distance between the axes of said pair of screws.

4,057,377

APPARATUS AND METHOD FOR NOODLE ROLLING

Hatuo Sakurazawa, 15 banchi, Sinozuka, Fujioka, Gunma, Japan

Filed May 17, 1976, Ser. No. 686,720
Int. Cl.² A21C *3/02*
U.S. Cl. 425—135 **4 Claims**



1. An apparatus for noodle rolling comprising:

a. a housing,

b. a plurality of roller sets disposed in the housing, each set being vertically arranged one below the other, each roller set comprising a pair of spaced apart rollers, the rollers of each set being spaced apart a distance sufficient to provide a gap therebetween,

c. a shaft for each roller, each roller being rotatably mounted on its associated shaft,

d. means operative to drive the shafts,

e. speed control means for each roller set, the speed control means controlling said driving means for setting the peripheral feed speed of the rollers in relation to the rollers of the other roller sets,

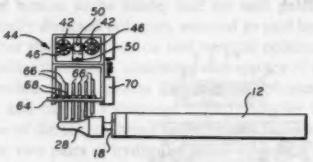
f. means operable to sense sagging of the noodle strip as it emerges from between a roller set and enters into the next lower roller set, the means being disposed between adjacent roller sets and being operatively connected to an associated speed control means, and

wherein the rollers of each pair are spaced apart a predetermined distance such that the space between such pairs progressively decreases along the vertical descent of the sets and further wherein the gap between any one roller set is such that it lies within a range corresponding to the distance between the shafts of the rollers of the immediately spaced below roller set.

4,057,378
TRAVERSING CORE ROD DETECTING DEVICE

Ernst Dieter Wunderlich, Teaneck, N.J., assignor to Rainville Company, Inc., Middlesex, N.J.

Filed Aug. 18, 1976, Ser. No. 715,631
Int. Cl.[2] B29D *23/02*
U.S. Cl. 425—137 11 Claims

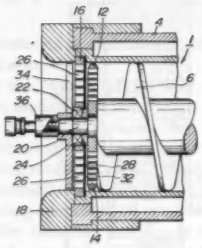


1. In injection blow molding apparatus having an indexing head with angularly related faces from which a plurality of core rods extend at locations spaced across the width of each face, an injection station, a blowing station, and a pick-off station at angularly spaced locations around the indexing head, and means for rotating the indexing head intermittently about a center to successively bring each face, and the core rods that extend therefrom, into position to cooperate with each of the stations, the combination comprising a carriage, a track extending lengthwise parallel to the extent of the face of the indexing head which is at rest at the pick-off station, the carriage being on said track and moveble lengthwise thereof, motor-operated motion-transmitting means that propel the carriage along the track following discharge of molded parts from the core rods at the pick-off station and only while the indexing head is stationary and prior to delivery of the rods to the injection station, a residue detector connected to and movable with the carriage transversely of the length of the core rods and extending into positions to strike against residue on each core rod while the indexing head remains at rest, if there is any residue on any of the core rods after blown objects have been stripped therefrom at the pick-off station, and a controller responsive to the striking of residue on any core rod by the detector during a traverse of the carriage across the stationary locations of the successive core rods at the pick-off station.

4,057,379
KNEADING AND EXTRUDING APPARATUS FOR EXTRUDABLE MATERIAL

Takuya Sato, Yao, Japan, assignor to Sato Iron Works Co., Ltd., Yao, Japan

Filed Oct. 29, 1974, Ser. No. 518,734
Claims priority, application Japan, June 4, 1974, 49-65193[U]
Int. Cl.[2] B29F *3/00*
U.S. Cl. 425—199 3 Claims

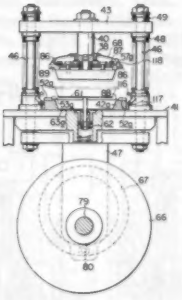


1. In a kneading and extending apparatus, comprising a base, a housing supported on the base and having an inlet opening at its one end and an outlet opening at the other end for receiving and discharging material, a hopper communicating with said inlet opening, a screw feeder housed in said housing for kneading and forcing said material toward said outlet opening of the housing, driving means connected to said screw feeder for driving said screw feeder, a perforated rotating disc secured to said screw feeder and rotating adjacent to said other end of the housing and formed with a number of holes through which the material passes while rotating, a perforated stationary disc fixed to said other end of the housing downstream of said rotating disc and having clearance with said rotating disc and formed with a number of holes through which the material passes, and a perforated punching plate fixed to a surface of said stationary disc that confronts said rotating disc and formed with a number of holes smaller than the holes through said discs, said perforated punching plate having clearance with said rotating disc within a range of 1–5 millimeters, whereby the material that passes through said holes of said rotating disc is turned into parallel with a surface of said perforated punching plate to aid the material to be sheared between the rotating disc and said punching plate; the improvement wherein said holes of the rotating disc are formed perpendicularly to surfaces of the disc and have a diameter of 10–20 millimeters and the total open area of the holes is about 60–70% of the area of the rotating disc.

4,057,380
TRAY-LIKE CONTAINER AND A METHOD OF AND AN APPARATUS FOR MANUFACTURING THE CONTAINER

Masaya Hosoe, Tokyo, Japan, assignor to Machida Shigyo Co., Ltd., Machida, Japan

Division of Ser. No. 565,960, April 7, 1975, Pat. No. 3,973,722.
This application Oct. 20, 1975, Ser. No. 624,056
Claims priority, application Japan, Apr. 16, 1974, 49-41687; Jan. 9, 1975, 50-4686; Jan. 22, 1975, 50-8680
Int. Cl.[2] B29C *3/00, 24/00*
U.S. Cl. 425—324.1 15 Claims



1. A molding press adapted to fold a flat paper blank into a tray-like container, the blank having a polygonal base panel with an even number of sides and corners, a continuous border around the base panel, and respective sets of three fold lines radiating from each corner of the polygonal base panel across the border to divide the border into side wall portions, contiguous with the respective sides of the base panel, and corner portions consisting of pairs of contiguous identical triangular panels that form respective gussets connecting adjacent side wall portions of the tray blank, the molding press comprising:

a female mold member having a molding cavity with an open mouth formed with an even number of corners corresponding to corners of a polygonal tray-like container to be formed in said molding cavity, a marginal surface portion surrounding the open mouth of the molding cavity, and seating means located adjacent to respective corners of the open mouth of the molding cavity and adapted to support a flat paper tray blank prior to folding, each seating means having an abutment spaced above the

marginal surface and adapted to contact a corresponding corner of such a tray blank at approximately the fold line between the respective pair of triangular panels;

a male mold member having an outer shape complementary to the molding cavity of the female mold member;

means for moving said male member into and away from said female mold member; and

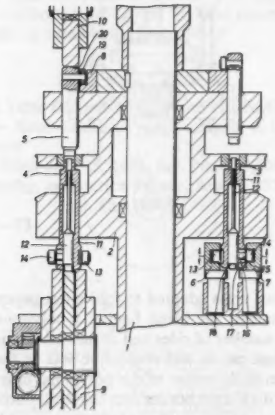
pressing means adapted to exert a force against only alternate ones of the side wall portions of such a tray blank when the blank is supported on the seating means, to press such alternate side wall portions against said marginal surface portion while leaving the other side wall portions adjacent to said alternate ones of the side wall portions unrestrained when the blank is forced into the molding cavity by moving the male mold member into the female mold members, whereby each contiguous pair of corner panels is folded inwardly on the common fold line between the panels by contact with the corresponding abutment, and said other side wall portions are folded upwardly as the blank enters the molding cavity so as to fold the contiguous triangular panels against the adjacent ones of the side wall portions when the mold members are fully engaged.

4,057,381

ROTARY PRESS

Wolfgang Korsch, Berlin, Germany, assignor to Emil Korsch, Spezialfabrik fur Komprimiermaschinen, Berlin, Germany

Filed Jan. 31, 1977, Ser. No. 764,077
Claims priority, application Germany, Feb. 4, 1976, 2604648
Int. Cl.[2] B29C *3/02;* B30B *11/08*
U.S. Cl. 425—345 **6 Claims**



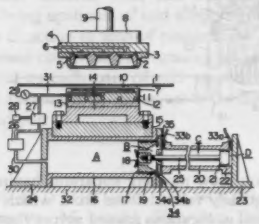
1. A rotary press comprising: a rotary driven matrix table for holding matrixes with boreholes; top and bottom dies; means for moving said dies in their axial direction towards and away from each other during rotation of the matrix table for pressing injected moldable material in said boreholes of the matrix; at least one of said dies for production of profiled articles comprising one outside and at least one inside die element, said outside and inside die elements being movable independently of each other; and at least one profiled press roller for directing said outside and inside die elements to different pressing paths for pressing movement of said outside and inside die elements.

4,057,382

APPARATUS FOR AIR-PRESSURE FORMING THERMOPLASTIC RESIN SHEETS

Masaji Yamamori, Nagoya, Japan, assignor to Mitsubishi Monsanto Kasei Kabushiki Kaisha, Tokyo, Japan

Filed July 29, 1975, Ser. No. 600,029
Claims priority, application Japan, Aug. 5, 1974, 49-89611
Int. Cl.[2] B29C *17/04*
U.S. Cl. 425—387.1 **7 Claims**



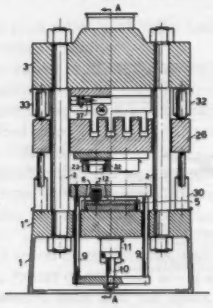
1. In an apparatus for air-pressure forming of thermoplastic resin sheets comprising a set of mold means having a plurality of air purging holes and complementary means having a plurality of compressed air blowing holes and air compressing means for supplying air at a specific pressure to said compressed air blowing holes, said set of mold means and complementary means being disposed in mutually opposed state so adapted that at least one of said means can be moved toward and away from the other, the improvement wherein said air compressing means comprises compressed air generating cylinder means, first piston means movable slidably within said compressed air generating cylinder means, hydraulic cylinder means, and second piston means movable slidably in said hydraulic cylinder means, said first piston means being mechanically connected to and driven by said second piston means which is in turn operatively connected to means for generating a substantially constant hydraulic pressure.

4,057,383

HYDRAULIC PRESS, PARTICULARLY FOR THE SHAPING AND PRESSING OF CYLINDRIC, OR TRUNCATED-CONE, OR LIKE SHAPED HOLLOW CERAMIC ARTICLES

Luigi Bettonica, Via Clusone, 3, Milan, Italy

Filed Jan. 3, 1977, Ser. No. 756,283
Claims priority, application Italy, Jan. 13, 1976, 19183/76
Int. Cl.[2] B30B *5/02, 11/00*
U.S. Cl. 425—405 H **4 Claims**



1. In a hydraulic press for the shaping and pressing of hollow ceramic articles, the combination of a bed plate fitted with a horizontal table; a double acting hydraulic jack fitted below of

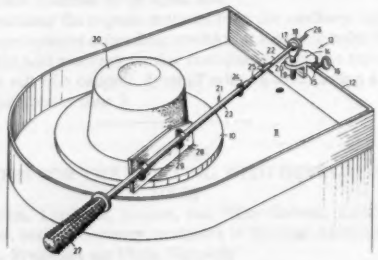
said table; a die having planoparallel front sides, and formed with a recess reproducing the negative outer shape of the article to be shaped and pressed; four uprights, slidingly fitted on guides, and by which said die is connected with the piston of said double acting hydraulic jack; a prismatic plate, slidingly fitted on said table, and to which at least one axially bored patrix is secured, being a bowl made of an elastically flexible and extensible material, reproducing the negative inner shape of the article to be made, laid on said patrix; two parallel, vertically directed columns, secured to said bed plate; a cross-member slidingly fitted on said vertical columns, and to which an ejector is secured, consisting said ejector of a cylindric body connected with a piston that can be operated by a pressure fluid, and having a diameter slightly smaller than that of top orifice of die recess, being same ejector fitted co-axially to said recess; two pairs of hydraulic jacks, by which said cross-member, bearing said ejector, is moved upwardly and downwardly, respectively; stop means for firmly retaining said cross member at the required height, whereby to keep closed the top of die recess while the article is being pressed; a hydraulic pump for feeding a pressure fluid throhgh the axial duct of patrix, wherein the elastically flexible and extensible bowl is laid, and a further hydraulic pump, for feeding the pressure fluid to hydraulic jacks by which the cross member, bearing the ejector, is controlled.

4,057,384

CLAY CENTERING DEVICE FOR A POTTER'S WHEEL

William Vincent Reid, 51 Pinelands Road, Sunnybank Hills, Queensland 4019, Australia

Filed Dec. 28, 1976, Ser. No. 755,065
Claims priority, application Australia, Jan. 30, 1976, 4677/76
Int. Cl.² B28B 1/29
U.S. Cl. 425—459 3 Claims



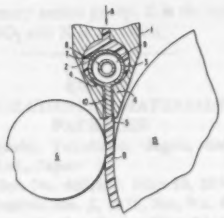
1. A clay centering device for a potter's wheel including:
a elongated arm,
a centering slab, with a substantially straight normally bottom edge, mounted on the arm,
a handle at one end of the arm, and
mounting means attachable to the tray of a potter's wheel,
said arm being rotatable about its longitudinal axis, and also being universally pivotable within said mounting means, the arm being adapted to be moved by means of the handle to bring the centering slab across the top of the potter's wheel, its bottom edge in contact therewith, to center a piece of clay on the wheel, to be raised and lowered to bring the centering slab above or down to the wheel, and to be twisted about its axis of rotation to vary the angle of inclination of the centering slab to the top of the wheel to shape the clay on the wheel.

4,057,385

DECKLE COOLING MEANS TO PREVENT LEAKAGE

Takao Yazaki, and Kazuhide Hattori, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 591,722, June 30, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,040
Claims priority, application Japan, June 29, 1974, 49-73807
Int. Cl.² B29F 3/04
U.S. Cl. 425—466 2 Claims



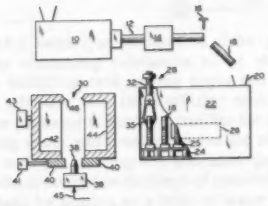
1. In a die structure having manifold means within the die structure for receiving molten resin, an outlet slit through which a thin film of molten resin may be extruded and deckle means for controlling the width of the resin film being extruded from said slit the improvement comprising said deckle means being comprised of a cylindrical portion having cooling passages therein disposed in said manifold means in contact with the portions of said die structure defining the entrance to said slit from said manifold and fin means integrally connected to said cylindrical portion and extending into said slit.

4,057,386

MEANS FOR CONTROLLING TEMPERATURE OF PICKER FINGERS TO ADJUST PARISON ALIGNMENT

Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 581,615, May 29, 1975, Pat. No. 3,985,850. This application July 16, 1976, Ser. No. 706,031
Int. Cl.² B29D 23/03
U.S. Cl. 425—526 4 Claims



1. In an apparatus for transferring an open end parison comprising in combination:
a parison heating means including means to deliver heated open end parisons in an upright position ;
vertically disposed plug means;
jaw means on opposed sides of said plug means, and means to move said jaw means in toward said plug means to form a neck finish on one end of a parison;
means carrying a pair of opposed picker fingers which close together so as to grip one and of said parison in said heating means and transfer said parison into position over said plug means; and
means to introduce fluid pressure into an interior of said parison, the improvement comprising means to adjust the temperature of one of said picker fingers to a level different from that of the other picker finger so as to cause said parison to camber slightly to align an opposite end of said parison over said plug means.

4,057,387

PROCESS FOR THE WHITENING OF TEXTILE FIBRES OF POLYESTERS

Klaus Kackstädter, and Hans Theidel, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 8, 1976, Ser. No. 647,409
Claims priority, application Germany, Jan. 11, 1975, 2500915
Int. Cl.[2] D06P *1/38*
U.S. Cl. 8—1 W 3 Claims

1. In the process for whitening textile fibers of polyester, of polyester blended with cotton or of polyester blended with wool, with a dispersed fluorescent whitening agent by the process of exhaustion from an aqueous liquor and subsequent thermofixation; the improvement comprising enhancing the whitening effect by utilizing a two-phase aqueous liquor containing an ester capable of forming a second phase and a water-soluble alkali metal salt or an ampholyte.

4,057,388

DRY HEAT PROCESS FOR DYEING AND PRINTING ORGANIC MATERIAL WHICH CAN BE DYED WITH CATIONIC DYESTUFFS

Raymond Defago, Riehen; Paul Schaffluetzel, Basel; Arnulf Ruediger Lapple, Arlesheim, all of Switzerland, and Bernard Hugelin, Gaillard, France, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 416,766, Nov. 19, 1973, abandoned.
This application Apr. 12, 1976, Ser. No. 675,896
Int. Cl.[2] D06P *5/00*
U.S. Cl. 8—2.5 A 22 Claims

1. In a dry heat transfer printing process which comprises

A. bringing a treated face of an auxiliary carrier into contact with the surface of an organic material to be dyed, the treated face of the auxiliary carrier being dry and bearing at least one color layer which contains dyestuff which passes into the vapor state under the transfer process conditions,

B. subjecting the carrier and the material while contacted to the action of heat for a sufficient time to effect transfer of the vaporizable dyestuff from the auxiliary carrier to the organic material to be dyed, and

C. separating the organic material from the auxiliary carrier, the improvement according to which at least one color layer of the said auxiliary carrier contains at least one transferable salt of a cationic dyestuff with an acid having a pK_a value greater than 3.

4,057,389

PROCESS FOR THE PRINTING WITH DEVELOPING DYES

Erich Feess, Lorsbach, Taunus, and Willy Gronen, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 6, 1976, Ser. No. 674,286
Claims priority, application Germany, Dec. 20, 1975, 2557554
Int. Cl.[2] C09B *27/00, 45/48;* D06P *3/12*
U.S. Cl. 8—71 16 Claims

1. A process for printing cellulosic textile material with a printing paste containing

a. the alkaline solution of a coupling component capable of forming developing dyes,

b. the dispersion of a diazotable amine capable of forming developing dyes,

c. sodium nitrite and

d. a thickener,

which process comprises developing the dyestuff on the fiber by adding a dilute aqueous solution of an organic acid of which at least 30 g are soluble in 100 g water, having at 20° C a pK value of 4 to 2.5 and at normal pressure a boiling point above 175° C, followed by a short air passage and a subsequent contact with an alkaline agent.

4,057,390

SULFUR-CONTAINING BIS-QUATERNARIES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed May 24, 1976, Ser. No. 689,134
Int. Cl.[2] C23F *11/00;* C09K *3/00;* C23F *9/00*
U.S. Cl. 21—2.7 R 10 Claims

1. A process of inhibiting corrosion which comprises treating a corrosive aqueous medium with Bis-quaternaries of the following formula:

$$(\text{N})^{+}\text{CH}_2\text{CH}_2)_2\,\text{Z}\cdot 2\text{X}^{-}$$

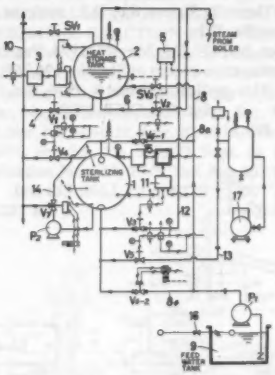
is an (N) is a quaternary amino group, Z is the sulfur-containing group S, SO, or SO_2 and X is an anion.

4,057,391

STEAM STERILIZATION OF MATERIALS IN SEALED PACKAGES

Kanemichi Yamaguchi, Yokohama, Japan, assignor to Toyo Seikan Kaisha Ltd., Japan

Continuation of Ser. No. 469,690, May 13, 1974, abandoned.
This application Jan. 2, 1976, Ser. No. 646,027
Claims priority, application Japan, May 22, 1973, 48-57022; May 22, 1973, 48-57023
Int. Cl.[2] A61L *1/00, 3/00;* A23L *3/10*
U.S. Cl. 21—56 5 Claims



1. In a method of batch type sterilization of the type wherein sealed packages containing substances to be sterilized are charged into a sterilizing tank having upper and lower portions, steam is admitted into the sterilizing tank into direct contact with the packages to heat and sterilize the sealed packages, and cooling water and pressurized gas are admitted into the sterilizing tank for cooling the sterilized packages, the improvement which comprises the steps of generating steam in a heat storage tank by heating up a body of water therein to a predetermined temperature by steam supplied from a boiler, the amount of water being sufficient to supply the necessary quantity of steam which when heated to the predetermined temperature is sufficient for rapid heating of the sterilizing tank, admitting the steam generated by said heat storage tank into said sterilizing tank without exhausting the steam therein until the pressure within said sterilizing tank reaches a predetermined value for rapidly heating up the interior of the sterilizing tank to a sterilizing temperature of from 135° to 150° C, continuing the admission of said steam generated by said heat storage tank into said sterilizing tank for maintaining said sterilizing temperature for a predetermined time, and admitting the cooling water into said sterilizing tank from the upper and lower portions thereof and then circulating the cooling water in the lower portion through the upper portion of said sterilizing tank, thus cooling the sterilized packages.

3. Apparatus for batch type sterilization comprising a sterilizing tank for accommodating sealed packages containing

substances to be sterilized, said sterilizing tank having upper and lower portions, means for admitting steam into said sterilizing tank into contact with the packages to heat and sterilize said packages, means for admitting cooling water into said sterilizing tank for cooling the sterilized packages, a heat storage tank which is heated by steam from a boiler for generating the steam to be admitted into said sterilizing tank at a predetermined temperature, said heat storage tank holding an amount of water sufficient to supply the necessary quantity of steam which when heated to said predetermined temperature is sufficient for rapid heating of the sterilizing tank to the sterilization temperature needed to sterilize said packages, a first valve means coupled between said heat storage tank and said sterilizing tank for admitting the steam generated by said heat storage tank into said sterilizing tank, and a second valve means provided for said sterilizing tank and discharging to the atmosphere, said second valve means being set to open when the pressure in the sterilizing tank reaches a predetermined value, whereby when the steam is firstly introduced into the sterilizing tank, the air therein is compressed until the pressure within said sterilizing tank reaches the predetermined value and only thereafter is the compressed air in the sterilizing tank released through said second valve means thus quickly heating up the tank.

4,057,392

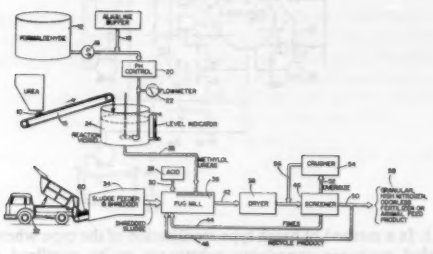
APPARATUS FOR TREATING SEWAGE SLUDGE

James M. O'Donnell, Slatersville, R.I., assignor to Orgonics, Inc., Slatersville, R.I.

Division of Ser. No. 472,714, May 23, 1974, Pat. No. 3,942,970, which is a continuation-in-part of Ser. No. 196,765, Nov. 8, 1971, abandoned. This application Mar. 8, 1976, Ser. No. 665,118

Int. Cl.² C05F 3/06

U.S. Cl. 23—259.1 **8 Claims**



1. An apparatus for the treatment of sludge filter cake material, which comprises in combination:

a. means to reduce the particle size of the sludge filter cake to be treated which comprises,
   i. a means to move a continuous bed of the sludge filter cake to be reduced,
   ii. a rotating raking reel means to shred the sludge filter cake on the bed into small particles,
   iii. a rotating leveling reel to provide a uniform bed of the shredded sludge material, and
   iv. means to convey the shredded sludge particles to the inlet section of the mixing means;

b. means to agitate, mix and react the reduced sludge material, which means includes,
   i. a rotating shaft within an elongated vessel,
   ii. the vessel including an inset at the one end of the vessel and an outlet at the other end, and defining a reaction section therein,
   iii. the shaft including a plurality of paddles secured thereto for rotation with the shaft to provide for mixing of the reduced sludge material and movement of the material from the inlet to the outlet,
   iv. means to introduce the reduced sludge into an inlet section of the vessel,
   v. means to introduce an acid material into the reduced sludge material in the vessel,
   vi. means to heat the vessel whereby the reaction section may be maintained at a reaction temperature from about 30° to 80° C,
   vii. means to introduce recycled dry sludge material into the inlet section of the vessel,
   viii. means to introduce into the reaction section of the vessel an aqueous condensable methylol-prepolymer solution for reaction with the sludge and for condensation, and
   ix. means to discharge a granular sludge-polymer reaction product from the outlet;

c. means to dry the discharged reaction product from the outlet to a desired moisture content of less than about 10%; and

d. means to screen the dry reaction product and to recover a dry reaction product of the desired particle size.

4,057,393

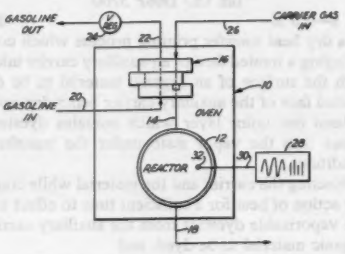
METHOD FOR OCTANE MONITORING

Paul A. Budzak, Cheswick, Pa., and Russell M. Clinton, III, Crosby, Tex., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 499,060, Aug. 20, 1974, Pat. No. 3,933,165. This application Aug. 6, 1975, Ser. No. 602,264

Int. Cl.² G01N 31/12, 33/22

U.S. Cl. 23—230 PC **6 Claims**



1. A method of charging a sample of a gasoline stream into a reactor containing an oxygen-containing gas for monitoring the octane number of the gasoline, said reactor being maintained at a temperature whereby combustion of the gasoline occurs in the reactor, comprising maintaining the gasoline stream under pressure high enough to prevent vaporization of the gasoline, periodically displacing a sample of the liquid gasoline into a chamber of large volume relative to the sample and containing a finely divided solid material adapted to hold liquid gasoline in the chamber by capillary action, said chamber being at a reduced pressure and at a temperature such that gasoline is vaporized in the chamber, delivering gasoline vapor from the chamber into the reactor, and after displacement of the liquid gasoline into the chamber passing a carrier gas through the chamber to evaporate gasoline therein and carry gasoline vapors into the reactor, the flow of carrier gas into the chamber being interrupted during the period of displacement of the liquid gasoline into the chamber.

5. In a method of monitoring the octane number of a gasoline stream by reacting in a reactor at substantially atmospheric pressure a sample of the gasoline stream with oxygen in a reaction less vigorous than an explosion and measuring a parameter of the reaction which is correlated with the octane number, the improvement comprising passing a stream of an oxygen-containing carrier gas into a chamber and from the chamber through a conduit into the reactor and through the reactor to purge hydrocarbons and reaction products therefrom, maintaining gasoline from the stream at an elevated temperature and at a pressure maintaining the gasoline in the liquid phase, interrupting the flow of oxygen-containing car-

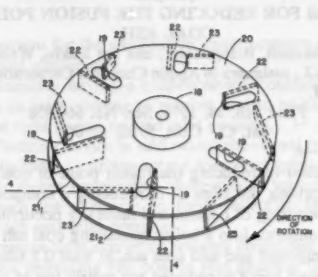
rier gas into the chamber by injecting a slug of the liquid gasoline filling a portion of the conduit into the stream of oxygen-containing carrier gas flowing to the chamber, delivering the slug of liquid gasoline into the chamber, maintaining the chamber at a reduced pressure whereby evaporation of gasoline occurs, said chamber forming a part of the conduit and having a large volume relative to the slug, distributing the gasoline over a large surface area in the chamber to prevent flow of liquid gasoline from the chamber and to increase the rate of vaporization of the gasoline in the chamber, flowing gasoline vapors from the chamber into the reactor, and continuing the flow of the oxygen-containing carrier gas through the conduit and the reactor after the interruption.

4,057,394

TEST DEVICE AND METHOD FOR DETERMINING BLOOD HEMOGLOBIN

Marvin Alden Genshaw, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 24, 1976, Ser. No. 688,981
Int. Cl.² G01N *31/22, 33/16*
U.S. Cl. 23—230 B **6 Claims**



1. A method for determining the hemoglobin content of blood, which comprises contacting a test device with a sample of blood and measuring light at a wavelength of between about 300 and about 620 nanometers which is reflected from said test device, wherein said test device comprises a substantially opaque, light reflective, blood absorbent matrix having a refractive index of less than about 1.0 or above about 1.7.

4,057,395

PROCESS FOR DETERMINING THE DONOR CONTENT OF POLYCRYSTALLINE SILICON OF HIGH PURITY TO BE USED IN THE SEMICONDUCTOR INDUSTRIES

Dietrich Schmidt, Burghausen, Germany; Karl Erwin Huber, Ach, Austria, and Johann Hofer, Kirchdorf, Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe mbH, Burghausen, Germany

Filed Dec. 1, 1976, Ser. No. 746,375
Claims priority, application Germany, Mar. 4, 1976, 2608965
Int. Cl.² G01N *27/04, 25/38*
U.S. Cl. 23—230 R **6 Claims**

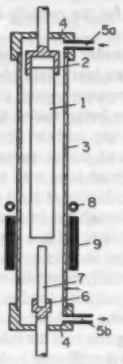
1. A process for determining the donor content of polycrystalline silicon of high purity to be used in the semiconductor industries, the silicon having a known acceptor content of up to at most 0.02 atomic % and a donor content of at most 0.1 atomic %, the determinaton comprising the steps of

introducing a test rod into a gas-tight quartz tube having an internal diameter only slightly larger than the test rod,

converting the rod into the oligocrystalline state by zone drawing with a seed crystal within a streaming protective gas,

forming a melting zone in the test rod travelling vertically over the entire length,

measuring the resistance of the so formed oligocrystalline test rod, and



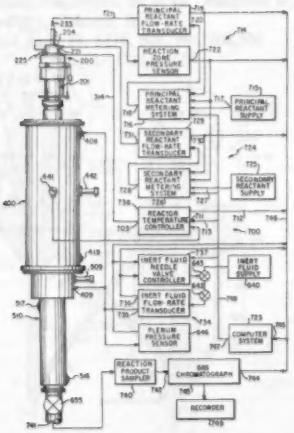
calculating the donor concentration from the measured resistance, the protective gas being a noble gas with an admixture of 10 – 800 ppm of oxygen.

4,057,396

FLUID-WALL REACTOR FOR HIGH TEMPERATURE CHEMICAL REACTION PROCESSES

Edwin Matovich, Brea, Calif., assignor to Thagard Technology Company, Irvine, Calif.

Continuation-in-part of Ser. No. 271,560, July 13, 1972, Pat. No. 3,933,434, Ser. No. 591,949, June 30, 1975, Ser. No. 591,950, June 30, 1975, Ser. No. 606,222, Aug. 20, 1975, Ser. No. 606,246, Aug. 20, 1976, and Ser. No. 616,393, Sept. 24, 1975. This application Nov. 14, 1975, Ser. No. 631,912
Int. Cl.² B01J *1/00*; F27B *17/00*
U.S. Cl. 23—252 R **43 Claims**



1. A high temperature fluid-wall reactor in which substantially all of the heat is supplied by radiation coupling, characterized by

A. a reactor tube having an inlet end and an outlet end, the interior of the tube defining a reactor chamber, the reactor tube being made of an electrically resistive, porous refractory material capable of emitting sufficient radiant energy to raise the temperature of reactants within the reactor tube to a level required to initiate and sustain the desired chemical reaction; the pores of the refractory material being of such diameter as to permit a uniform flow of

sufficient inert fluid which is substantially transparent to radiant energy through the tube wall to constitute a protective blanket for the radially inward surface of the reactor tube;

B. a fluid-tight, tubular pressure vessel enclosing the reactor tube to define an inert fluid plenum between the reactor tube and the pressure vessel, the inlet and outlet ends of the reactor tube being sealed from the plenum; the pressure vessel having an inlet for admitting the inert fluid which is directed under pressure into the plenum and through the porous tube wall into the reactor chamber;

C. means for introducing at least one reactant into the reactor chamber through the inlet end of the reactor tube, the reactants being directed in a predetermined path axially of the reactor tube and being confined by the protective blanket substantially centrally within the reactor chamber and out of contact with the inner wall of the reactor tube;

D. means for passing an electric current through the reactor tube for heating the reactor tube to the temperature level at which it emits sufficient radiant energy to initiate and sustain the desired chemical reaction, the radiant energy being directed centrally therewithin substantially coincident with at least a portion of the path of the reactants; and

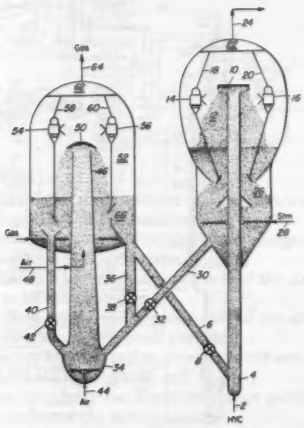
E. a circumferential heat shield disposed within the pressure vessel and radially outwardly of the reactor tube, the heat shield reflecting radiant energy toward the reactor tube.

4,057,397

SYSTEM FOR REGENERATING FLUIDIZABLE CATALYST PARTICLES

Benjamin Gross, Cherry Hill, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 380,173, July 18, 1973. This application Mar. 8, 1976, Ser. No. 665,149
Int. Cl.² B01J *8/24*
U.S. Cl. 23—288 B **5 Claims**



1. An apparatus for regenerating catalyst particles deactivated with carbonaceous material which comprises,

a. a first upwardly extending elongated catalyst contact chamber of larger diameter in a lower bottom portion thereof than in the upper major portion thereof,

b. the upper end of said first elongated contact chamber in open communication with cyclonic separation means,

c. an upper portion of said elongated contact chamber and cyclonic separation means housed within a separate enlarged second chamber,

d. said cyclonic separation means in open communication with outlet conduit means extending from a top portion of said second chamber,

e. a first open ended conduit means in open communication with a lower portion of said second chamber and the lower larger diameter portion of said first catalyst contact chamber,

f. a second conduit means for passing deactivated catalyst particles to the lower larger diameter portion of said first catalyst contact chamber,

g. a third open ended conduit means in extending directly between a lower portion of said second chamber and said second conduit means,

h. valve flow control means in each of said first, second and third conduit means,

i. means for separately introducing gaseous material to a lower bottom portion of each of said first and second chambers and

j. conduit means for withdrawing regenerated catalyst particles from a lower portion of said second chamber for transfer to a hydrocarbon conversion chamber.

4,057,398

PROCESS FOR REDUCING THE FUSION POINT OF COAL ASH

Robert P. Bennett, Bridgewater, and Ira Kukin, West Orange, both of N.J., assignors to Apollo Chemical Corporation, Whippany, N.J.

Filed Feb. 24, 1976, Ser. No. 660,838
Int. Cl.² C10L *9/00, 10/00*
U.S. Cl. 44—4 **8 Claims**

1. A method of reducing the fusion point of coal ash in a boiler comprising the steps of introducing a compound from the class consisting of borates and naturally occurring boron-containing minerals into a boiler containing coal ash and mixing said compound and said coal ash, at least 0.5 kilograms of said compound being introduced per metric ton of coal introduced into the boiler.

2. The method of claim 1 wherein said compound is introduced into the furnace box of the boiler as an intimate mixture of pulverized coal and said compound, and including the additional step of intimately mixing said compound with pulverized coal prior to introduction of the mixture into the furnace box.

4,057,399

PROCESS FOR DEWATERING CARBONACEOUS MATERIALS

Edward L. Cole, Fishkill; Howard V. Hess, Glenham, and William F. Franz, Gardiner, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,516
Int. Cl.² C10L *9/00, 10/00*
U.S. Cl. 44—6 **5 Claims**

1. A process for the transportation and subsequent dewatering of a solid carbonaceous material which comprises grinding said material to particles capable of passing through an 8 mesh sieve, slurrying the resulting particulate material with water, passing the slurry through a pipeline and then separating the slurry into water and water-wet particles by pumping the slurry to a dewatering screen belt, air-blowing the water-wet particles, mixing said air-blown water-wet particles with a hydrocarbon liquid in an amount between 20 and 500 weight percent basis particulate material, heating the mixture to a temperature between 300° and 705° F. at a pressure between 100 and 3500 psig sufficient to maintain the hydrocarbon and water in the liquid phase and then recovering oil-wet but substantially waterfree solid carbonaceous particles from the mixture.

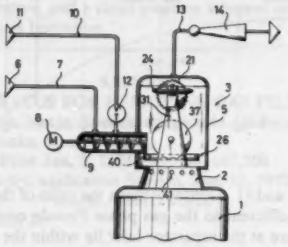
5. The process of claim 1 in which the said solid carbonaceous material is lignite.

4,057,400

APPARATUS FOR THE GASIFICATION UNDER PRESSURE OF BITUMINOUS COAL ESPECIALLY OF FINE COAL IN A GENERATOR

Walter Kaimann, Pollerbecks Brink 40, D-4300 Essen; Rudolf Pasternak, Lubecker Str. 15, D-4390 Gladbeck, and Jochen Bauer, Rosastr. 61, D-4300 Essen, all of Germany

Filed Sept. 7, 1976, Ser. No. 720,984
Claims priority, application Germany, Sept. 9, 1975, 2540151
Int. Cl.² C10J *3/30*
U.S. Cl. 48—77 1 Claim



1. Apparatus for the gasification under pressure of fine bituminous coal, comprising

a. a generator having a coal-receiving container provided with an inlet opening to receive coal to be gasified,

b. a gas tight casing on said inlet opening,

c. a pelletizing device in said casing above said inlet opening and including a driven rotary apertured grinding face and roller means cooperating therewith to squeeze fine coal through the apertures to form pellets to feed directly through said inlet opening,

d. a pressure tight conveyor housing connected to said casing for delivering fine coal to said grinding face,

e. a conveyor in said housing, and

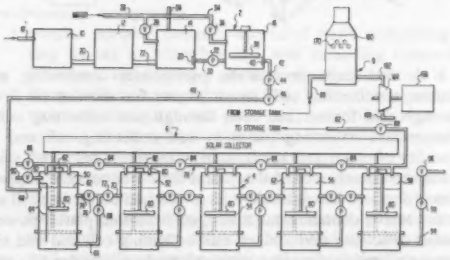
f. separate means for feeding fine coal and a binder to said conveyor housing.

4,057,401

METHANE GAS PROCESS AND APPARATUS

Oliver W. Boblitz, Basye, Va., assignor to Bio-Gas Corporation, Washington, D.C.

Filed Sept. 3, 1976, Ser. No. 720,257
Int. Cl.² C02C *1/14*
U.S. Cl. 48—111 5 Claims



1. Apparatus for the manufacture of methane gas comprising:

a plurality of digester tanks arranged in series,

first conduit means connecting said tanks for fluid flow between them, pump means to provide fluid flow through said first conduit means,

agitator means for mixing liquid material contained within said tanks,

a substantially air-tight enclosure surrounding said tanks,

a solar heater to heat a stream of air passing through the heater,

second conduit means connecting said enclosure with said solar heater for passage of a stream of air from said enclosure to said solar heater,

third conduit means connecting said solar heater to said enclosure for passing a stream of air heated in said solar heater into said enclosure for indirect heat exchange with liquid material contained within said tanks,

fourth conduit means connected to said enclosure to remove methane gas produced in said tanks therefrom,

fifth conduit means connected to the last digester tank in said series to remove liquid material from said last tank, and

sixth conduit means connected to the first digester tank in said series to introduce liquid material into said first tank.

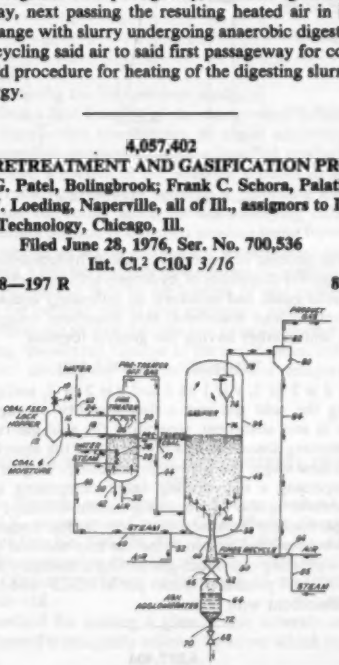
3. In the method of producing methane gas by anaerobic digestion of a slurry of water material at a pH of between about 6 and 8 and a temperature between about 100° to 140° F wherein methane gas produced by bacterial action upon the heated slurry is collected and dewatered solid residue for use as fertilizer is obtained, the improvement which comprises exposing a metal screen to rays of the sun passing through a transparent panel spaced apart from said metal screen forming a first longitudinal passageway therebetween, said panel defining the sunward side of a gas-tight chamber, said chamber having a second longitudinal passageway substantially parallel to said first passageway defined by the shadow side of said metal screen and the spaced-apart back of said chamber, passing air through said first passageway, then through said second passageway, next passing the resulting heated air in indirect heat exchange with slurry undergoing anaerobic digestion and finally recycling said air to said first passageway for continuation of said procedure for heating of the digesting slurry using solar energy.

4,057,402

COAL PRETREATMENT AND GASIFICATION PROCESS

Jitendra G. Patel, Bolingbrook; Frank C. Schora, Palatine, and John W. Loeding, Naperville, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed June 28, 1976, Ser. No. 700,536
Int. Cl.² C10J *3/16*
U.S. Cl. 48—197 R 8 Claims



1. In a process for the conversion of finely divided caking coal to a fuel gas wherein said process includes the steps of pretreating a finely divided coal feed material at a temperature of about 700°-800° F in a fluidized pretreatment zone while forming hot off gases, said pretreatment zone being in direct communication with a gasification zone, passing the pretreated coal from said pretreatment zone to said gasification zone, maintaining said pretreated coal as a fluidized bed in said gasification bed in said gasification zone at preselected conditions

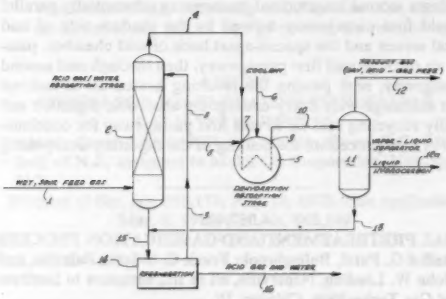
for converting said pretreated coal to ash and a gaseous mixture comprising fuel gas, with drawing said gas from said gasification zone, and withdrawing said ash from said gasification zone, an improvement in said process comprising the steps of adding water directly into said pretreatment zone to dissipate heat generated therein and to generate steam, passing said hot off gases from said pretreatment zone to below the upper surface of said fluidized coal bed in said gasification zone, said off gases comprising said steam, tars, oils and coal fines, passing said off gases upwardly through said fluidized bed, reacting said steam with said coal in said fluidized bed for converting said coal to said ash and said gaseous mixture, said off gases heating said gasification zone for assisting in maintaining said preselected conditions in said gasification zone, substantially destroying said tars and oils during passage through said fluidized bed in said gasification zone, and converting said fines in said off gases to a portion of said gaseous mixture and a portion of said ash.

4,057,403

GAS TREATING PROCESS

A. R. Valdes, Houston, Tex., assignor to Fluor Corporation, Los Angeles, Calif.

Filed Oct. 29, 1973, Ser. No. 410,626
Int. Cl.[2] B01D *53/14*
U.S. Cl. 55—31 **12 Claims**



1. In the process of treating a gaseous hydrocarbon stream for the removal therefrom of hydrogen sulfide, carbon dioxide or both acid gases, and moisture, by intimately contacting the stream with a lean absorbent, said absorbent comprising an hydroxy amino ether having the general formula

$$HO\text{-}\left[(CH_2)_x\text{-}O\right]_y(CH_2)_z NH_2$$

wherein x is 2 or 3, y is 1 to 4 and z is 2 or 3, and gas-liquid absorbing the acid gas and a first quantity of vapor phase moisture in said absorbent, separating the acid gas-rich, moisture-containing absorbent and regenerating the absorbent with heat in a first stage; the improvement comprising in a second stage dispersing a dehydrating agent comprising additional lean absorbent in the hydrocarbon stream obtained from the first stage, cooling the absorbent-hydrocarbon stream mixture to condense residual moisture therein into solution in the absorbent separating a product gas having a moisture content of not more than 7 pounds of water per MMSCF; and regenerating the absorbent with heat.

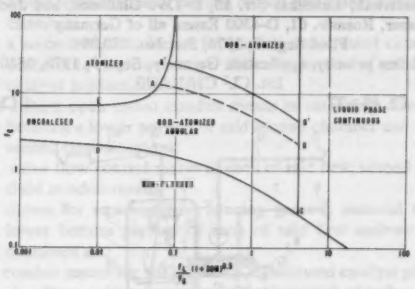
4,057,404

METHOD FOR SEPARATING IMMISCIBLE FLUIDS OF DIFFERENT DENSITY

R. Bertrum Diemer, Jr., Wilmington, N.C., and James B. Dunson, Jr., Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 23, 1976, Ser. No. 660,182
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—90 **14 Claims**

1. A method for separating a flowing mixture of immiscible fluids of different density in which a higher density fluid phase is dispersed within a lower density fluid phase comprising passing the mixture through a centrifugal separator having an N_D value of between 50 and 150 under conditions of non-atomizing flow such that the coordinates of the gas phase Froude



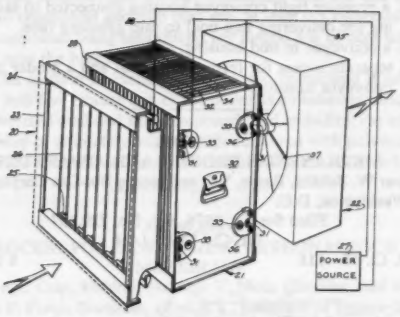
coefficient and $(1 + 30M)^{0.5}$ times the ratio of the liquid phase Froude coefficient to the gas phase Froude coefficient of the fluid mixture at the separator inlet lie within the enclosed area defined by points A, A', B' and B in FIG. 1 hereto.

4,057,405

MEANS FOR THE CLEANING AND SELF-CLEANING OF AN ELECTROSTATIC PRECIPITATOR

William A. Cheney, and Wendell P. Spurgin, both of Cincinnati, Ohio, assignors to United Air Specialists, Inc., Cincinnati, Ohio

Filed Feb. 25, 1976, Ser. No. 661,291
Int. Cl.[2] B03C *3/76*
U.S. Cl. 55—105 **5 Claims**



1. A two stage electrostatic precipitator comprising: an ionizer; a collecting cell; an air mover for moving air first through said ionizer and then through said collecting cell; contaminant collecting plates in said collecting cell and a plurality of upper and lower support members on which said plates are directly mounted adjacent their four corners; hopper means disposed beneath said ionizer and said collecting cell so as to receive contaminants dislodged from said plates; power means to actuate said ionizer, said collecting cell and said air mover; vibration directing means to apply vibrations of variable frequency directly to one of said lower support members and at right angles to said plates whereby to dislodge contaminants from said plates into said hopper means; said vibration directing means including a vibrator operatively connected to said one lower support member, and control means to actuate said vibrator; interlock means operatively connecting said power means and said control means to prevent simultaneous actuation of said power means and said vibrator; additional means for said control means and said vibrator to vary the

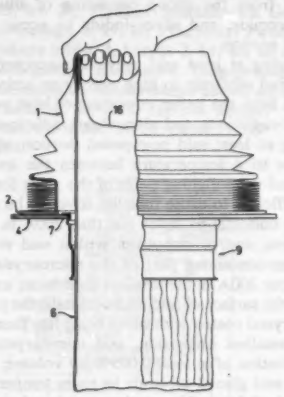
frequency of said vibrator, said additional means comprising a source of compressed air and a tank operatively connected to said source, said tank of compressed air being connected to said precipitator and emptied while actuating said vibrator; and a first electric circuitry connected to and including said power means, a second electric circuitry connected to and including said control means, and said interlock means including a switch arrangement operatively connected in said first and in said second electric circuitry and having an off position whereat both the said power means and the said control means are inoperative, an on position whereat only the said power means is operative, and a clean position whereat only the said control means is operative.

4,057,406

APPARATUS FOR REMOVING GAS FILTER

Staffan Jansson, Vaxjo, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Jan. 8, 1976, Ser. No. 647,308
Claims priority, application Sweden, Jan. 13, 1975, 7500295
Int. Cl.² B01D *50/00*
U.S. Cl. 55—385 R **10 Claims**



1. In combination with a filter mounted in a working position adjacent and on one side of an opening in a wall, apparatus for enabling the lifting of said filter from its working position on said one side of said wall, through said opening in said wall and into the open environment on the other side of said wall, without substantial dispersal of dirt from said filter into said open environment, comprising:

a annular portable centrally-apertured stand comprising a ring having a circumferential web extending upwardly therefrom and having a passage extending through it of diameter large enough for said filter to be at least partially removed through it, and removably positioned over said opening on the opposite side of said wall from filter, with said passage aligned with said opening;

tubular means of flexible material having one end disposed about an outer portion of said stand and secured to said stand so that the interior of one end of said tubular means surrounds the space directly above said opening in said wall, whereby at least a portion of said tubular means can be manually stripped from said stand and said filter can be withdrawn through said opening into said tubular means by grasping said filter through said flexible material of said tubular means;

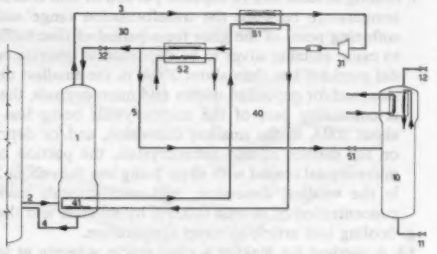
said stand being adapted temporarily to maintain its position over said opening and on the surface of said wall on said one side thereof, despite normal forces tending to displace it produced in response to said removing of said filter through said opening.

4,057,407

METHOD AND APPARATUS FOR RECOVERING ARGON FROM AN AIR FRACTIONATING PROCESS

Emanuele Bigi, Bergamo, Italy, assignor to S.I.A.D. Societa' Italiana Acetilene E Derivati, Bergamo, Italy

Filed Mar. 22, 1976, Ser. No. 669,420
Claims priority, application Italy, Mar. 26, 1975, 21663/75
Int. Cl.² F25J *3/04*
U.S. Cl. 62—22 **8 Claims**



1. A method for producing argon by separation from oxygen and nitrogen from an air fractionation process, characterized in that it comprises the steps of:

a. forwarding to a rectifying column a gaseous argon, nitrogen and oxygen containing product coming out from an intermediate point of air fractionation column of said fractionation process;

b. heating a gaseous oxygen-free product containing a major amount of argon drawn from the head of said rectifying column;

c. compressing the oxygen-free product;

d. cooling a first fraction of the compressed product up to the liquefaction temperature of argon according to the compression pressure to form a liquefied product;

e. recycling a portion of the liquefied product to the top of said rectifying column through a throttling element to provide the reflux liquid for the rectifying column, the remaining portion of liquefied product being forwarded to the inlet of an argon column for withdrawing nitrogen;

f. causing a second fraction of compressed, gaseous oxygen-free product to flow to the bottom of said rectifying column for indirect reboil heat exchange, and

g. recycling the second fraction in a partially cooled state, by having transferred calories to the rectification column, for further cooling up to the liquefaction temperature of argon.

4,057,408

METHOD FOR MAKING PHOTOSENSITIVE COLORED GLASSES

Joseph E. Pierson, and Stanley D. Stookey, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 646,259, Jan. 2, 1976, Pat. No. 4,017,318.
This application Oct. 28, 1976, Ser. No. 736,517
Int. Cl.² C03B *23/20*; C03C *15/00*; C03B *32/00*; C03C *17/00*
U.S. Cl. 65—18 **24 Claims**

1. A method for making a glass article wherein at least a portion thereof is integrally colored by silver which comprises the steps:

a. melting a batch for a glass containing the constituents of alkali fluoride, the constituents of at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide, and about 0.0 to 0.2% CeO_2;

b. forming said melt into a glass article;

c. exposing at least a portion of said article to high energy or actinic radiation selected from the group consisting of high velocity electrons, X-radiations, and ultra-violet radiations;

d. heating at least said exposed portion of the article to a temperature between about the transformation range and the softening point of the glass for a period of time sufficient to cause nucleation and growth of microcrystals of sodium fluoride containing at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide to occur within said exposed portion;

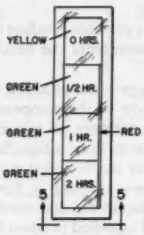
e. re-exposing at least said previously-exposed portion of said article to said high energy or actinic radiation;

f. heating at least said re-exposed portion of said article to a temperature between the transformation range and the softening point of the glass for a period of time sufficient to cause metallic silver to be deposited as discrete colloidal particles less than about 200A in the smallest dimension, and/or deposited within said microcrystals, the sivler-containing part of the microcrystals being less than about 200A in the smallest dimension, and/or deposited on the surface of said microcrystals, the portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume; and then

g. cooling said article to room temperature.

12. A method for making a glass article wherein at least a portion thereof is integrally colored by silver which comprises the steps:

a. contacting the surface of a glass article containing Na_2O, F, at least one halide selected from the group consisting of Cl, Br, and I, "and about 0 to 0.2% CeO_2." with a silver-containing material;



b. heating said glass article and said silver-containing material in contact therewith for a sufficient length of time to effect an exchange of silver ions for sodium ions in at least the surface of the glass;

c. exposing at least a portion of said article to high energy or actinic radiation selected from the group consisting of high velocity electrons, X-radiations, and ultra-violet radiations;

d. heating at least said exposed portion of the article to a temperature between about the transformation range and the softening point of the glass for a period of time sufficient to cause nucleation and growth of microcrystals of sodium fluoride containing at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide to occur within said exposed portion;

e. re-exposing at least said previously-exposed portion of said article to high energy or actinic radiation selected from the group consisting of high velocity electrons, X-radiations, and ultra-violet radiations;

f. heating at least said re-exposed portion of said article to a temperature between the transformation range and the softening point of the glass for a period of time sufficient to cause metallic silver to be deposited as discrete colloidal particles less than 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or deposited on the surface of said microcrystals, the portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume;

g. cooling said article to room temperature.

15. A method for coating a glass, glass-ceramic, ceramic, or metal substrate with a colored glaze comprising the steps of:

a. melting a batch for a glass containing the constituents of sodium fluoride and the constituents of at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide; and about 0–0.2% CeO_2;

b. forming said melt into a glass and comminuting said glass into a frit;

c. applying said frit to the substrate to be coated;

d. firing the coated substrate at a temperature sufficient to sinter the frit into a tightly-adherent glaze;

e. exposing at least a portion of said glazed substrate to high energy or actinic radiation, selected from the group consisting of high velocity electrons, X-radiations, and ultra-violet radiations;

f. heating at least said exposed portion of the glazed substrate to a temperature between about the transformation range and the softening point of the glaze for a period of time sufficient to cause nucleation and growth of microcrystals of sodium fluoride containing at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide to occur within said exposed portion;

g. re-exposing at least said previously-exposed portion of said glazed substrate to high energy or actinic radiation, selected from the group consisting of high velocity electrons, X-radiations, and ultra-violet radiations;

h. heating at least said re-exposed portion of the glazed substrate to a temperature between the transformation range and the softening point of the glaze for a period of time sufficient to cause metallic silver to be deposited as discrete colloidal particles less than 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or deposited on the surface of said microcrystals, the portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume; and then

i. cooling said glazed substrate to room temperature.

18. A method for making a glass article wherein at least a portion thereof is integrally colored by silver in a single color which comprises the steps:

a. melting a batch for a glass containing the constituents of sodium fluoride, the constituents of at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide, about 0 to 0.2% CeO_2" and a thermoreducing agent;

b. forming said melt into a glass article;

c. subjecting at least a portion of said glass article to an elevated temperature between about the transformation range and the softening point of the glass for a period of time sufficient to reduce part of the silver to metallic silver and initiate nucleation and growth of microcrystals of sodium fluoride containing at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide;

d. exposing at least said portion of the glass article subjected to said elevated temperature to high energy or actinic radiation selected from the group consisting of high velocity electrons, X-radiations, and ultra-violet radiations;

e. heating at least said exposed portion to a temperature between the transformation range and the softening point of the glass for a period of time sufficient to cause metallic silver to be deposited as discrete collodial particles less than 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or deposited on the surface of said microcrystals, the portion of the microcrystal coated with silver

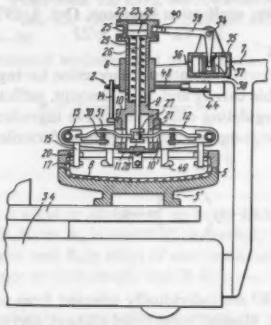
being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume; and then

f. cooling said article to room temperature.

4,057,409
APPARATUS FOR MAKING CATHODE-RAY TUBE SCREENS WITH INTEGRALLY FORMED CONTOURED FIXTURES

Alexandr Alexandrovich Kudryavtsev, Novye Cheremushki, kvartal 34a, korpus 4, kv. 3; Vitaly Mikhailovich Firsov, 9 Parkovaya ulitsa, 8, kv. 25; Evgeny Fedorovich Solinov, Novorogozhskaya ulitsa, 15, korpus 2, kv. 59; Mark Klavdievich Symon, 1 Volkovsky proezd, 12, kv. 4; Pavel Ivanovich Litvinov, Novorogozhskaya ulitsa, 11, korpus 2, kv. 25; Albert Pavlovich Veresov, Novorogozhskaya ulitsa, 14, korpus 2, kv. 54; Ivan Alexandrovich Rybakov, Novorogozhskaya ulitsa, 11, korpus 2, kv. 63; Viktor Timofeevich Trishin, ulitsa Smirnovskaya, 11, kv. 27; Vladimir Mikhailovich Goryannikov, ulitsa Litvina-Sedogo, 3, kv. 24; Vyacheslav Pavlovich Savin, Novorogozhskaya ulitsa, 4, korpus 2, kv. 43, all of Moscow, and Igor Georgievich Kashkarov, Dolgoprudny, Vodniki, ulitsa Stantsionnaya, 5, Moskovskaya oblast, all of U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,467
Int. Cl.² C03C *27/02*; C03B *21/00*
U.S. Cl. 65—154 **6 Claims**

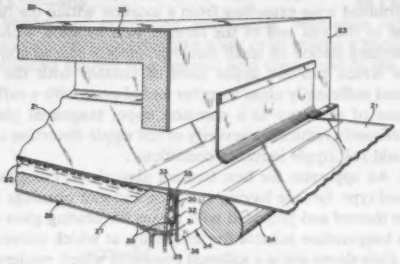


1. An apparatus for manufacturing cathode-ray tube screens having integrally formed contoured fixtures for securing elements inside the screen, comprising means (5) arranged on a base (3) for holding said screen (B) and means for moulding said contoured fixtures (2) including a plurality of frames (12) each having mounted therein a heater (49) and a moulding tool 17; means for moving (12, 13, 15, 22-24, & 26-31) said moulding tools (17) from a radially retracted or inward position away from the screen surface to a radially extended or outward position pressing against said screen; means for vertically reciprocating (34-40) said contoured fixture moulding means from a position, wherein said heaters and tools face generally opposite to the surfaces where said contoured fixtures are to be formed to a position above the top of said mould holding said screen; and means (10, 14, & 42-48) for horizontally swinging in an arc or oscillating said frames (12) from a first locked position to a second locked position; whereby one of said locked positions enables said screen to be locally heated by said heaters at such surfaces where said contoured fixtures are to be formed, and the other of said locked positions enables said moulding tools to be moved toward said screen for impressing said contoured fixtures upon said screen.

4,057,410
HEAT SHIELD FOR FLOAT GLASS FORMING APPARATUS AND METHOD OF USING

Lloyd W. Daman, Pemberville; Don V. Marti, II, Toledo; Freddie Mason, Oregon, and Donald E. Shamp, Millbury, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 18, 1976, Ser. No. 715,549
Int. Cl.² C03B *18/02*
U.S. Cl. 65—65 A **7 Claims**



1. A float glass forming apparatus comprising:

a. a tank containing a bath of molten metal upon which a ribbon of glass is continuously formed;

b. an exit end on said tank defining a lip over which said ribbon is discharged;

c. means mounted on said exit end next to said lip for cooling said exit end of said tank; and

d. means loosely mounted on said cooling means adjacent said lip for shielding said cooling means from heat radiating from said ribbon glass whereby the surface of said cooling means is maintained at a temperature such that molten metal escaping from said exit end lip of said tank and contacting said cooling means is solidified.

5. A method of stopping a tin leak at the exit end of an operating float glass forming apparatus having a tank containing a bath of molten tin upon which a ribbon of glass is continuously formed and a cooler at the exit end of the tank wherein the exit end of the tank and cooler absorb heat radiated from the adjacent glass ribbon and lift-out and conveying rolls of higher temperature comprising the steps of:

a. forming a heat shield from a sheet of millboard insulating material;

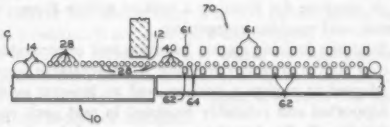
b. treating the formed sheet of insulating material with a solution of potassium sulfate; and

c. interposing said heat shield between said cooler and said glass ribbon and lift-out and conveying rolls so that said cooler can be operated at a rate to reduce its outside temperature below the melting temperature of the tin.

4,057,411
HEAT TREATING GLASS SHEETS ON A ROLLER HEARTH CONVEYOR

Thomas J. Reese, Sarver, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 4, 1976, Ser. No. 655,049
Int. Cl.² C03B *27/00*
U.S. Cl. 65—114 **12 Claims**



1. A method of heat-treating a flat glass sheet comprising: conveying the sheet in a horizontal disposition on a roller

conveyor through a tunnel-type furnace and then through a quenching station, heating the sheet during its passage through the furnace to a temperature suitable for tempering at which the sheet is in a softened condition and is susceptible to roll ripple distortion, cooling the sheet during its passage through the quenching station with blasts of cooling medium applied to opposite surfaces of the sheet, and wherein the sheet during an initial, major portion of its travel through the furnace encounters conditions that induce roll ripple distortion in the sheet, and thereafter supporting the sheet as it passes through a predetermined zone extending from a location within the furnace close to the exit end of the furnace to a location within the quenching station on small diameter, closely spaced conveyor rolls which provide upper lines of contact with the sheet spaced sufficiently close together and aligned with a sufficient degree of accuracy to a common upper tangential plane to significantly reduce the severity of roll ripple distortion caused by said roll ripple inducing conditions.

6. An apparatus for heat treating glass sheets comprising: a tunnel-type furnace having entrance and exit openings in the ends thereof and provided with means for heating glass sheets to a temperature suitable for tempering, at which temperature the glass sheets are in a softened condition which renders them susceptible to roll ripple distortion, a quenching station having means for directing tempering medium against opposite surfaces of glass sheets, and a roller conveyor adapted for transporting glass sheets sequentially through said furnace and then said quenching station along a generally horizontal path, said roller conveyor comprised of a plurality of rolls each having a cylindrical sheet-supporting portion extending transversely to the direction of glass sheet movement and presenting a substantially horizontal line of contact with the glass sheets, said conveyor having a predetermined zone extending from a location within the furnace close to the exit end of the furnace to a location within the quenching station, a portion of the conveyor upstream from said predetermined zone presenting roll ripple inducing conditions to glass sheets passing thereover, the rolls in said predetermined zone having small diameters and being sufficiently closely spaced and being aligned with one another to a sufficient degree of accuracy such that the lines of glass contact lie essentially within a common horizontal plane to significantly reduce the severity of roll ripple distortion caused by said roll ripple inducing conditions upstream from said predetermined zone.

4,057,412

FORMING STATION FOR A MACHINE FOR FORMING HOLLOW ARTICLES OF VITREOUS MATERIAL

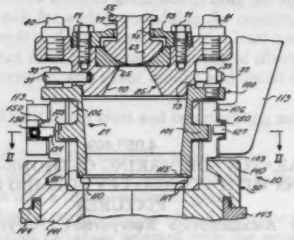
Lothar Schaar, Heuerssen, Germany, assignor to Hermann Heye, Obernkirchen, Germany

Continuation of Ser. No. 469,846, May 14, 1974, Pat. No. 3,951,637. This application Dec. 12, 1975, Ser. No. 640,385
Claims priority, application Germany, May 15, 1973, 2324953
The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.
Int. Cl.² C03B *11/00, 9/14*
U.S. Cl. 65—229 **8 Claims**

1. A machine for forming a hollow article from vitreous material, said machine comprising:

at least one forming station having a pair of separable neck ring halves together forming a nonrotatable neck ring adapted to engage a parison, and an integral guide ring supported and rotatably mounted in said neck ring and rotationally fixed to the parison engaged thereby;

means at said forming station for jointly rotating said guide ring and the parison rotationally fixed thereto relative to said neck ring and thereby making rotation symmetrical the parison rotationally fixed to said guide ring and engaged by said neck ring; and



means at said forming station for preventing rotation of said neck ring jointly with said guide ring during rotation of said guide ring and the parison rotationally fixed thereto.

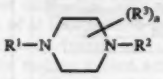
4,057,413

METHODS AND COMPOSITIONS FOR REGULATING PLANT GROWTH USING PIPERAZINE COMPOUNDS

Klaus Naumann, Cologne; Klaus Lurssen, Grosskoenigsdorf; Klaus Sasse, Schildgen; Ulrich Holtschmidt, and Gunter Schwarzmann, both of Essen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 12, 1975, Ser. No. 612,813
Claims priority, application Germany, Oct. 9, 1974, 2448003
Int. Cl.² A01N *9/22*
U.S. Cl. 71—76 **44 Claims**

1. A plant-growth-regulating composition having an agriculturally acceptable carrier and, in an amount, sufficient to exert plant-growth regulating effects, an active ingredient comprising a piperazine compound of the general formula



(I)

wherein

R^1, R^2, and R^3 are individually selected from alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl or cycloalkyl,

n is 0, 1, 2, 3, or 4.

4,057,414

HERBICIDAL COMPOSITIONS

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, heiress-at-law), assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 3, 1975, Ser. No. 627,965
Claims priority, application Germany, Nov. 18, 1974, 2454576
Int. Cl.² A01N *9/00*
U.S. Cl. 71—88 **1 Claim**

1. A herbicide composition consisting essentially of a herbicidally inert carrier having dispersed therein a herbicidally effective amount of a mixture of

a. a member selected from the group consisting of O-(methylaminosulfonyl)-glycolic acid hexamethylene amide and O-(methylaminosulfonyl)-glycolic acid heptamehylene amide, and

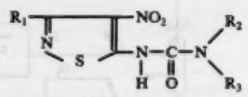
b. propionic acid-3,4-dichloroanilide in a weight ratio of (a) to (b) in the range of 4:1 to 1:4.

4,057,415
NITROISOTHIAZOLYLUREAS AS HERBICIDES

Arthur Albert Ramsey, Middleport, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed June 18, 1976, Ser. No. 697,455
Int. Cl.[2] C07D 275/02; A01N 9/12
U.S. Cl. 71—90 4 Claims

1. A substituted isothiazolylurea of the formula:



in which R_1 is straight or branched alkyl of 1 to 4 carbons; R_2 is alkyl of 1 to 4 carbons; R_3 is hydrogen or alkyl of 1 to 4 carbons.

3. An herbicidal composition comprising an herbicidally effective amount of a compound of claim 1 in admixture with an agriculturally acceptable extender.

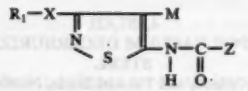
4. A method of preventing and destroying plant growth which comprises applying to the locus to be protected an herbicidally effective amount of a compound of claim 1.

4,057,416
3-ALKYLTHIO-, 3-ALKYLSULFINYL-, AND 3-ALKYLSULFONYLISOTHIAZOLE DERIVATIVES AS HERBICIDES

Loren Kenneth Gibbons, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed June 18, 1976, Ser. No. 697,458
Int. Cl.[2] C07D 275/02; A01N 9/12
U.S. Cl. 71—90 19 Claims

1. A substituted isothiazole of the formula:



wherein R_1 is alkyl or alkenyl of up to six carbon atoms;

Z is $—NR_2R_3$ or R_4 in which R_2 is methyl, R_3 is methyl or hydrogen, and R_4 is alkyl of one to six carbon atoms;

M is cyano or carbamoyl; and X is ——, —SO—, or —SO_2—.

18. A herbicidal composition comprising an herbicidally effective amount of a compound of claim 1 in admixture with an extender.

19. A method of preventing and destroying undesired plant growth which comprises applying to the locus to be protected an herbicidally effective amount of a compound of claim 1.

4,057,417
6-SEC.-BUTYL-1,2,4-TRIAZIN-5(4H)-ONE COMPOUNDS AND HERBICIDAL COMPOSITIONS

Karlfried Dickoré, Leverkusen; Ludwig Eue, and Robert Rudolf Schmidt, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 26, 1975, Ser. No. 562,293
Claims priority, application Germany, Apr. 10, 1974, 2417511
Int. Cl.[2] A01N 9/22, 9/00; C07D 253/06
U.S. Cl. 71—93 13 Claims

1. A compound selected from the group consisting of

4-amino-6-sec.-butyl-3-methylthio-1,2,4-triazin-5(4H)-one,

4-benzylideneamino-6-sec.-butyl-3-methylthio-1,2,4-triazin-5(4H)-one,

4-isobutylideneamino-6-sec.-butyl-3-methylthio-1,2,4-triazin-5(4H)-one, and

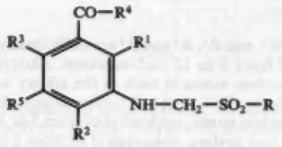
4-furfurylidene-amino-6-sec.-butyl-3-methylthio-1,2,4-triazin-5(4H)-one.

4,057,418
SULFONYLMETHYLAMINO-SUBSTITUTED BENZOIC ACIDS AND HERBICIDAL METHOD THEREWITH

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Rolf Schröder, all of Wuppertal, and Ludwig Eue, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 19, 1976, Ser. No. 650,580
Claims priority, application Germany, Feb. 3, 1975, 2504383
Int. Cl.[2] A01N 9/14; C07C 147/11, 147/107
U.S. Cl. 71—103 10 Claims

1. Method of combating undesirable vegetation which method comprises applying to a plant or its habitat a herbicidally effective amount of a benzoic acid compound of the formula



(I),

in which

R is alkyl or substituted alkyl of up to 6 carbon atoms, where the substituents are selected from halogen, or

R is aryl, and substituted aryl where the substituents are selected from halogen and alkyl of up to 4 carbon atoms,

R^1 is alkyl, alkoxy or alkylmercapto, of in each case up to 4 carbon atoms, or halogen,

R^2 is hydrogen,

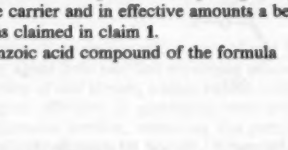
R^3 is hydrogen or halogen, and

R^4 is hydroxyl;

R^5 is halogen or alkyl of up to 4 carbon atoms.

4. Herbicidal composition comprising an agriculturally acceptable carrier and in effective amounts a benzoic acid compound as claimed in claim 1.

5. Benzoic acid compound of the formula



(I),

in which

R is alkyl or substituted alkyl of up to 6 carbon atoms, where the substituents are selected from halogen, or

R is aryl, and substituted aryl where the substituents are selected from halogen and alkyl of up to 4 carbon atoms,

R^1 is alkyl, alkoxy or alkylmercapto, of in each case up to 4 carbon atoms, or halogen,

R^2 is hydrogen,

R^3 is hydrogen or halogen, and

R^4 is hydroxyl,

R^5 is halogen or alkyl of up to 4 carbon atoms.

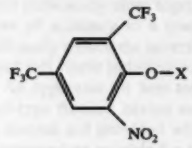
4,057,419

2,4-BIS-(TRIFLUOROMETHYL)-6-NITROPHENOL COMPOUNDS AND HERBICIDAL COMPOSITIONS

Klaus Wagner; Ludwig Eue; Robert R. Schmidt, and Ernst Roos, all of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 489,206, July 17, 1974, Pat. No. 3,943,180, which is a division of Ser. No. 335,400, Feb. 23, 1973, Pat. No. 3,894,074. This application Oct. 23, 1975, Ser. No. 625,276
Claims priority, application Germany, Feb. 29, 1972, 2209528
Int. Cl.[2] A01N *9/20, 9/24;* C07C *79/22, 87/00*
U.S. Cl. 71—121 **8 Claims**

1. 2,4-bis-(trifluoromethyl)-6-nitrophenol compound of the formula

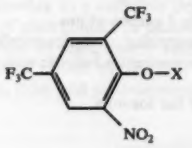


wherein

X is $HN^+R^1R^2R^3$; and R^1, R^2 and R^3 are individually hydrogen, alkyl of from 1 to 12 carbon atoms, alkoxyalkyl of from 1 to 4 carbon atoms in each of the alkoxy and alkyl moieties, hydroxyalkyl of up to 3 carbon atoms, alkenyl of from 2 to 4 carbon atoms, cycloalkyl of from 5 or 6 carbon atoms in the ring system, phenylalkyl of from 1 or 2 carbon atoms in the alkyl moiety and phenyl which may be substituted by chlorine, bromine, trifluoromethyl, nitro or methyl.

6. Herbicidal composition comprising a herbicidally acceptable carrier and, as an active ingredient, effective amounts of a compound as claimed in claim 1.

7. Method of combatting undesired vegetation which method comprises applying to said vegetation or its habitat a herbicidally effective amount of a 2,4-bis-(trifluoromethyl)-6-nitrophenol derivative of the general formula



wherein

X is $HN^+R^1R^2R^3$ and R^1, R^2 and R^3 are individually hydrogen, alkyl of from 1 to 12 carbon atoms, alkoxyalkyl of from 1 to 4 carbon atoms in each of the alkoxy and alkyl moieties, hydroxyalkyl of up to 3 carbon atoms alkenyl of from 2 to 4 carbon atoms, cycloalkyl of from 5 to 6 carbon atoms in the ring system, phenylalkyl of from 1 or 2 carbon atoms in the alkyl moiety, and phenyl which may be substituted by chlorine, bromine, trifluoromethyl, nitro or methyl

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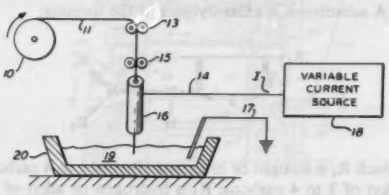
4,057,420

METHODS FOR DISSOLVING VOLATILE ADDITION AGENTS IN MOLTEN METAL

Arthur A. Brace, Mountainside, and Alexander Lesnewich, New Providence, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Filed Feb. 6, 1976, Ser. No. 655,794
Int. Cl.[2] C21C *7/00*
U.S. Cl. 75—53 **5 Claims**

1. A method for reacting impurities in molten steel in a vessel exposed to the atmosphere with an addition agent having a boiling point below the melting point of steel comprising the steps of providing a wire having a metallic sheath encapsulating said agent in powder form therein; passing an electric current through at least a portion of said wire thereby resistively preheating said wire; feeding the preheated wire, while said current is passed therethrough, into said molten steel such that said metallic sheath is melted and said addition agent is sublimed before the wire can contact a vessel wall; and con-



trolling the value of said electric current such that said resistive preheating and heating of said wire by conduction of heat from said molten steel are effective to melt said sheath and sublime said addition agent at a predetermined depth in said molten steel such that said sublimed addition agent reacts with said impurities before said agent rises by buoyancy to the surface and escapes from said molten steel.

4,057,421

PROCESS FOR VACUUM DECARBURIZATION OF STEEL

Takashi Fukui, Minoo, and Takami Ikeda, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Continuation of Ser. No. 516,911, Oct. 22, 1974, abandoned. This application Aug. 10, 1976, Ser. No. 713,236
Int. Cl.[2] C21C *7/10*
U.S. Cl. 75—60 **5 Claims**

1. A process for the vacuum decarburization of steel under reduced pressure by mounting a ladle filled with molten steel in a closed decarburization vessel and agitating the molten steel by blowing gas through a tuyere in the ladle to prevent oxidation of alloy metals in the low carbon range, the improvement comprising the steps of:

blowing lancing oxygen through an oxygen lance using a laval nozzle having a nozzle exit Mach number in the range of 2 – 4 wherein the laval nozzle has a divergent passage from its throat to its tip;

maintaining the laval nozzle at a fixed height above the surface of the molten steel; and

controlling the flow rate of oxygen in accordance with variations in the presence within the vessel to maintain the Mach number in the above specified range in accordance with the following formula:

$$P_0 = P_2/(1 + \frac{-K-1}{2} M_2^2)\, k/(k-1)$$

wherein M_2 is the Mach number at the nozzle exit;

P_0 is the pressure in the lance in Kg/m^2, absolute,

P_2 is the pressure in the vessel (kg/m^2, absolute),

and K is the ratio of specific heats at constant pressure and volume.

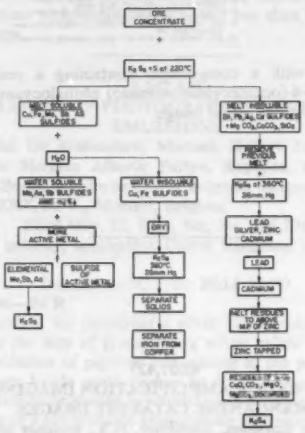
4,057,422
ORE TREATMENT PROCESS

Rollan Swanson, 220 California Ave., Santa Monica, Calif. 90403

Continuation-in-part of Ser. No. 467,099, May 6, 1974, Pat. No. 3,957,503. This application Mar. 1, 1976, Ser. No. 662,507

Int. Cl.² C22B *19/04, 13/08*

U.S. Cl. 75—86 6 Claims



1. A process for extracting an ore containing a metal selected from the group consisting of: iron, copper, zinc, arsenic, antimony, molybdenum, silver and cadmium, said metals being present in either their sulfidic or oxidic forms, comprising preheating said ore to a temperature sufficient to dehydrate same; mixing said ore at said temperature with a anhydrous, air-free melt containing a compound selected from the group consisting of saturated hydrogen and alkali metal polysulfides and an amount of sulfur sufficient to sulfidize those metals present in their oxidic form and to completely oxidize those metals present in their sulfide forms; separating by filtering while hot the melt-soluble sulfides of Mo, As, Sb, Cu, and Fe from the melt-insoluble sulfides with water to separate said saturated polysulfide and the water-soluble sulfides of Mo, As and Sb from the water-insoluble sulfides of Cu and Fe; mixing said water-soluble sulfides in aqueous solution with a more electropositive metal thereby precipitating said metals in their elemental form together with the sulfide of said more electropositive metal and said saturated polysulfide, drying said water-insoluble copper and iron sulfides; reacting copper and iron sulfides with a melt containing a saturated hydrogen or alkali metal polysulfide at a temperature above the melting point of said polysulfide under a vacuum of between one-half Torr and 760 mm; separating the resulting free metals from said melt and magnetically separating said iron from said copper; treating said melt-insoluble Zn, Pb, Ag, and Cd sulfides with a saturated hydrogen or alkali metal polysulfide under a vacuum of between 1/2 Torr and 760 mm; separating lead containing Cd, Ag, and Zn dissolved therein; placing a cover layer of an unsaturated hydrogen or alkali metal polysulfide over said lead, heating the resulting mixture above the melting point of zinc to distill said zinc and collecting said zinc.

4,057,423
METHOD FOR THE MANUFACTURE OF MERCURY FREE SULFURIC ACID

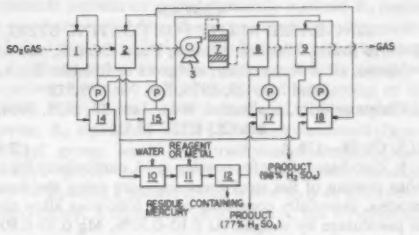
Hisahiro Kinoshita, Tokyo, Japan, assignor to Mitsui Mining & Smelting Co., Ltd. and Hachinohe Smelting Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 286,712, Sept. 6, 1972, Pat. No. 3,954,451. This application Dec. 15, 1975, Ser. No. 640,432

Claims priority, application Japan, Sept. 10, 1971, 46-70625; Feb. 28, 1972, 47-20820; Feb. 29, 1972, 47-21384; Apr. 24, 1972, 47-41633

Int. Cl.² C22B *43/00*; C01B *17/90*

U.S. Cl. 75—109 15 Claims



6. In a method of manufacturing substantially mercury-free sulfuric acid by roasting non-ferrous metalsulfide material and then removing dust, cooling, washing and removing mist from the roasted gas to prepare a cool feed gas containing SO_2 and impurities comprising water and mercury, removing said impurities from the roasted gas, converting the SO_2 to SO_3 and absorbing the SO_3 in dilute sulfuric acid, the improvement which comprises:

continuously flowing a stream of said feed gas into and through first scrubbing means and therein continuously scrubbing said feed gas with a continuously circulating stream of first liquid scrubbing agent consisting essentially of sulfuric acid solution having an H_2SO_4 concentration of from 30 to 99 wt.% and having a temperature of from 20° to 70° C to absorb impurities comprising water and mercury present in said cool feed gas into said scrubbing agent and to produce a stream of purified feed gas containing SO_2;

continuously removing said stream of said first liquid scrubbing agent from said first scrubbing means, withdrawing a portion of said stream, adding to said withdrawn portion a reagent effective to precipitate mercury present in said withdrawn portion, removing the precipitated mercury from said withdrawn portion, recovering the balance of said withdrawn portion as a purified dilute sulfuric acid solution, and continuing to circulate the balance of said stream of said first liquid scrubbing agent through said first scrubbing means without precipitating and removing mercury present therein;

continuously feeding said stream of purified feed gas exiting from said first scrubbing means through second scrubbing means and therein continuously scrubbing said purified feed gas with a continuously circulating stream of second liquid scrubbing agent consisting essentially of sulfuric acid solution having an H_2SO_4 concentration of about 98 to 99 wt.% and a temperature of about 60° to 80° C to absorb into said second scrubbing agent an additional quantity of the mercury present in said purified feed gas whereby to produce an additionally purified feed gas containing SO_2, said second liquid scrubbing agent having a higher concentration, a higher temperature or both higher concentration and higher temperature, than said first liquid scrubbing agent;

converting the SO_2 in said additionally purified feed gas to SO_3 and then flowing the SO_3-containing gas through two absorption stages in series and in each of said stages contacting said SO_3-containing gas with different dilute sulfu-

ric acid solutions to absorb the SO_3 whereby to produce two separate concentrated sulfuric acid solutions, the dilute sulfuric acid solution employed in the first absorption stage comprising the purified dilute sulfuric acid solution obtained by precipitating mercury from the scrubbing agent used in the first scrubbing means, the dilute sulfuric acid solution employed in the second absorption stage comprising a second portion of the scrubbing agent employed in the first scrubbing means and which is not subjected to mercury removal, and including the step of feeding the concentrated sulfuric acid solution from the second absorption stage to said second scrubbing means to serve as said second scrubbing agent therein.

4,057,424
ZINC-BASED ALLOY FOR COATING STEEL

Roberto Bruno; Massimo Memmi; Paolo Berardi, and Augusto Musso, all of Rome, Italy, assignors to Italsider S.p.A., Italy

Filed May 25, 1976, Ser. No. 689,911
Claims priority, application Italy, June 13, 1975, 50042/75
Int. Cl.² C22C *18/04*
U.S. Cl. 75—178 A **2 Claims**

1. Zinc-based alloy for coating steel, particularly for continuous coating of flat steel sheet and wire using the Sendzimir process, essentially consisting of the following alloy elements in percentage by weight: Al 0.10–0.30%, Mg 0.30–0.80%, Cr 0–0.20%, Ti 0–0.20%, the balance being zinc, the ratio of Mg/AL being 4 or less and the ratio of Cr/Al being 1.5 or less.

4,057,425
2-SUBSTITUTED BENZIMIDAZOLES IN MULTICOLOR DIFFUSION TRANSFER

Ronald F. Lambert, Wayland, and Howard G. Rogers, Weston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed July 16, 1975, Ser. No. 596,384
Int. Cl.² G03C *7/00, 1/40, 1/76, 5/30*
U.S. Cl. 96—3 **26 Claims**

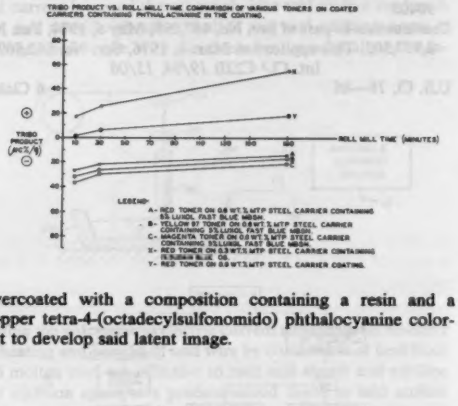
1. A diffusion transfer color process comprising exposing a photosensitive element comprising a blue-sensitive silver halide emulsion having a yellow dye developer associated therewith, a greensensitive silver halide emulsion having a magenta dye developer associated therewith, and a red-sensitive silver halide emulsion having a cyan dye developer associated therewith, applying an aqueous alkaline processing composition to said exposed photosensitive element to effect development and to form an imagewise distribution of unoxidized dye developer in undeveloped areas of each of said silver halide emulsions as a function of said development, said process including the step of transferring by diffusion at least a portion of said imagewise distributions of unoxidized dye developer to an image-receiving layer in superposed relationship therewith to thereby provide a multicolor diffusion transfer image, at least one of said silver halide emulsions having associated therewith in the same layer or in an adjacent layer a 2-substituted benzimidazole selected from the group consisting of 2-phenyl-benzimidazole, 2-β-naphthyl-benzimidazole, 2-p-tolyl-benzimidazole, 2-(2'-chlorophenyl)-benzimidazole and 2-(2'-thienyl)-benzimidazole, said 2-substituted benzimidazole being present in a quantity effective to provide improved temperature latitude.

4,057,426
MAGENTA TONER WITH A COATED CARRIER

Joseph Mammino, Penfield, and Franklin Jossel, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 29, 1975, Ser. No. 617,763
Int. Cl.² G03G *9/10, 13/01*
U.S. Cl. 96—1 SD **14 Claims**

8. An electrostatographic imaging process comprising establishing an electrostatic latent image on a surface and contacting said surface with an electrostatographic developer comprising toner particles and coated carrier particles, said toner particles comprising a resin and a 2,9-dimethylquinacridone colorant and said coated carrier comprises carrier material particles

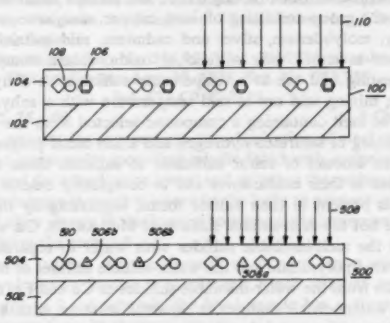

TRIBO PRODUCT VS. ROLL MILL TIME COMPARISON OF VARIOUS TONERS ON COATED CARRIERS CONTAINING PHTHALOCYANINE IN THE COATING.
TRIBO PRODUCT (μc/g)
ROLL MILL TIME (MINUTES)
LEGEND
A- RED TONER ON 0.8 WT.% MTP STEEL CARRIER CONTAINING 5% LUXOL FAST BLUE MBSN.
B- YELLOW 87 TONER ON 0.8 WT.% MTP STEEL CARRIER CONTAINING 5% LUXOL FAST BLUE MBSN.
C- MAGENTA TONER ON 0.8 WT.% MTP STEEL CARRIER CONTAINING 5% LUXOL FAST BLUE MBSN.
X- RED TONER ON 0.3 WT.% MTP STEEL CARRIER CONTAINING 1% SUDAN BLUE OS.
Y- RED TONER ON 0.8 WT.% MTP STEEL CARRIER COATING.

overcoated with a composition containing a resin and a copper tetra-4-(octadecylsulfonomido) phthalocyanine colorant to develop said latent image.

4,057,427
PEROXIDE REDOX AMPLIFICATION IMAGING USING MANGANESE CATALYST IMAGES

Philip Maury Enriquez, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,079
Int. Cl.² G03C *7/00, 5/24*
U.S. Cl. 96—55 **85 Claims**



1. A method of forming a dye image comprising:

imagewise reducing a cobalt(III) complex to cobalt(II) to form an immobile cobalt complex image in an imaging layer of a photographic element,

forming in the imaging layer an immobile catalytic manganese complex image which is a reversal of the cobalt complex image, said manganese complex image exhibiting a substantially higher degree of catalytic activity than said reversal immobile cobalt complex image, and

employing the imaging layer containing the immobile catalytic manganese complex image and the reversal cobalt complex image as a catalyst in a peroxide redox amplification reaction occurring at the site of said manganese complex image to form a dye image.

4,057,428

PHOTOGRAPHIC ELEMENTS CONTAINING ANIONIC ORGANIC ACIDS

Rowland George Mowrey; Donald Arthur Smith, and Richard Calvin Sutton, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 20, 1972, Ser. No. 307,892
Int. Cl.[2] G03C 7/00, 3/00, 1/72
U.S. Cl. 96—74 13 Claims

1. A photographic element comprising a support having thereon at least one image dye-providing layer unit containing a silver halide emulsion at a coverage of less than 30 mg./ft.[2] and a photographic color coupler, and at least one layer containing at least 25 mg./ft.[2] of a nondiffusible anionic organic polymeric compound having acid groups thereon and having an equivalent weight of at least 70 and less than 300 based on acid groups.

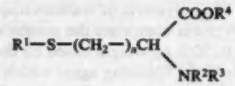
4,057,429

PREPARATION OF PHOTOGRAPHIC SILVER HALIDE EMULSIONS

Luc Achiel De brabandere, Mortsel; Robert Joseph Pollet, Vremde; Herman Alberik Pattyn, Kapellen, and Hendrik Alfons Borginon, Mortsel, all of Belgium, assignors to AGFA-GEVAERT, N. V., Mortsel, Belgium

Filed Mar. 12, 1976, Ser. No. 666,206
Claims priority, application United Kingdom, Apr. 9, 1975, 14586/75
Int. Cl.[2] G03C 1/02; B01J 17/00
U.S. Cl. 96—94 R 13 Claims

1. A method for preparing a silver halide emulsion which comprises the step of precipitating silver halide grains in an aqueous solution of peptizer and adding to the peptizer solution a silver halide grain ripener to accelerate grain growth wherein before or during precipitation from about 500 mg to about 30 g of a silver halide grain ripener corresponding to the following formula is added to the peptizer solution per mole of silver halide to be formed:



wherein:

n is an integer from 1 to 5

R^1 is a C_1–C_5 alkyl group

R^2 is hydrogen, a C_1–C_5 alkyl group or a carboxylic acyl group

R^3 is hydrogen, a C_1–C_5 alkyl group or substituted alkyl, and

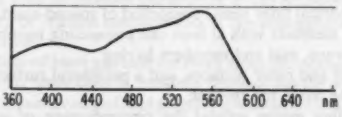
R^4 is hydrogen, a C_1–C_5 alkyl group, an aryl group or a salt-forming cation.

4,057,430

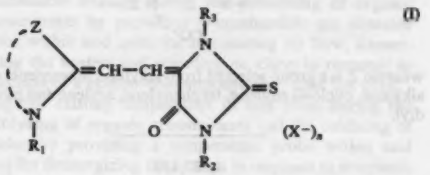
SILVER HALIDE PHOTOGRAPHIC EMULSION

Akira Sato; Akira Ogawa; Masanao Hinata, and Haruo Takei, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 464,094, April 25, 1974, abandoned.
This application Feb. 9, 1976, Ser. No. 656,685
Claims priority, application Japan, Apr. 25, 1973, 48-47467
Int. Cl.[2] G03C 1/22
U.S. Cl. 96—100 R 14 Claims



1. A silver halide photographic emulsion containing at least one sensitizing dye represented by the following general formula (I):



(I)

in which Z represents an atomic group necessary for forming a benzoxazole nucleus or a naphthoxazole nucleus; R_1 represents a member selected from the group consisting of an unsubstituted alkyl group; an alkyl group substituted with a hydroxy group, an alkoxy group, an acyloxy group, a carboxy group, an alkoxycarbonyl group, a sulfo group, or an aryl group; or an allyl group; R_2 represents an alkyl group, an allyl group or an aryl group; R_3 represents an N-(N,N-dialkylaminoalkyl)carbamoylalkyl group, an N-(N,N-trialkylammoniumalkyl)carbamoylalkyl group or an N,N,N-trialkylammoniumalkyl group, with R_2 being a phenyl group where R_3 is an alkoxycarbonylalkyl group; X represents an acid anion; and n represents 0 or 1.

9. The silver halide photographic emulsion of claim 1, wherein said silver halide emulsion contains at least one of a chemical sensitizer, an optical sensitizer, a hardener, an antifoggant, a stabilizer, a coating aid, and a color coupler.

4,057,431

ETHYLENICALLY POLYURETHANE UNSATURATED COMPOSITION

Anthony F. Finelli, Akron; Shirish Jasani, Cuyahoga Falls, both of Ohio, and Columbus Williams, Jr., Doerun, Ga., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 29, 1975, Ser. No. 617,883
Int. Cl.[2] G03C 1/68; G08F 18/24
U.S. Cl. 96—115 R 10 Claims

1. A liquid ethylenically unsaturated polyetherurethane composition having no free NCO, being readily removable from a substrate by an alkaline water wash and being capable of being polymerized by actinic light to yield a solid having a Shore A hardness of at least 30, said composition being composed of a polyetherurethane consisting essentially of reaction products of polyether polyol having 2 to 3 hydroxyls, organic polyisocyanate and hydroxyl acrylate or methacrylate having an alkyl radical containing 2 to 3 carbon atoms and sufficient polyethylene polyol acrylate or methacrylate to give the composition a viscosity at 24° C. of 2,000 to 10,000 centipoises.

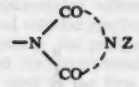
4,057,432

ACYLACETANILIDE COUPLER WITH HETEROCYCLIC DIACYL AMINO COUPLING-OFF GROUP

Mitsuto Fujiwhara, Hachioji; Tamotsu Kojima, Kokubunji, and Syunji Matsuo, Fussa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 211,468, Dec. 23, 1971, abandoned.
This application July 16, 1973, Ser. No. 379,730
Claims priority, application Japan, Dec. 26, 1970, 45-119053
Int. Cl.[2] G03C 7/00, 1/40
U.S. Cl. 96—56.2 6 Claims

1. In a process for forming a yellow image in a silver halide light-sensitive color photographic material, comprising processing the photographic material by a color developer in the presence of an acyl acetanilide type 2-equivalent yellow coupler having active methylene herein and a split off group substituted for one of the two hydrogens on the active methylene, the improvement which comprises the split-off group being represented by the following general formula:



wherein Z is a group selected from alkylene, alkenylene, cycloalkylene, cycloalkenylene, terphenylene, arylene and pyridinediyl.

4,057,433

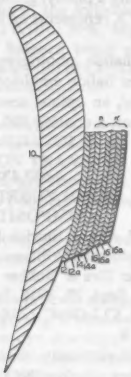
OXYFLUORIDE-TYPE MOLD FOR CASTING MOLTEN REACTIVE AND REFRACTORY METALS

Robert A. Brown, Scio, Oreg., assignor to Rem Metals Corporation, Albany, Oreg.

Continuation-in-part of Ser. No. 448,254, March 5, 1974, abandoned, which is a continuation of Ser. No. 332,608, Feb. 15, 1973, abandoned, which is a continuation of Ser. No. 174,662, Aug. 25, 1971, abandoned. This application Aug. 1, 1975, Ser. No. 601,611

Int. Cl.² B28B 7/34

U.S. Cl. 106—38.3 10 Claims



1. A mold for casting molten reactive and refractory metals comprising:

a. a facing portion comprising finely divided particles of at least one member of the group consisting of the oxyfluorides of the metals of Group IIIa, and the lanthanide and actinide series of Group IIIa, of the Mendeleevian periodic chart of the atoms, and a binder therefor,

b. said oxyfluorides having free energies of formation at 1000° K. of at least 69 kilocalories per gram atom of contained oxygen and fluorine, and

c. a backup portion comprising finely divided particles of shell mold back up material and a binder therefor.

4,057,434

OPAQUE INFRA-RED TRANSMITTING GLASS-CERAMIC ARTICLES

Hermann L. Rittler, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 603,544, Aug. 11, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 730,808

Int. Cl.² C03C 3/22, 3/04

U.S. Cl. 106—39.7 1 Claim

1. An opaque glass-ceramic article demonstrating a coefficient of thermal expansion (20°–700° C.) less than 15, excellent chemical durability, an infra-red transmittance at a wavelength of 3.5 microns through a polished plate of about 4.25 mm. thickness in excess of 40%, and wherein beta-spodumene solid solution constitutes the principal crystal phase, consisting essentially, by weight on the oxide basis, of about 2.5–4.5% Li_2O, 0.75–3.5% ZnO, 17.5–21% Al_2O_3, 65–71% SiO_2, 3.5–6% TiO_2, and being essentially free from alkaline earth metal oxides, alkali metal oxides other than Li_2O, and ZrO_2.

4,057,435

OPTICAL GLASSES

Jean E. Boudot, and Pascal A. J. Joly, both of Avon, France, assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 8, 1976, Ser. No. 730,809

Claims priority, application France, Apr. 16, 1976, 76.11357

Int. Cl.² C03C 3/08

U.S. Cl. 106—47 Q 3 Claims

1. A glass having a composition within the $CaO—La_2O_3—TiO_2—B_2O_3—SiO_2$ family and having a refractive index at least on the order of 1.7, a dispersive index at least on the order of 40, a density of about 3 g/cm³, and a weight loss, as measured in the AO test, of less than 5 mg/cm², consisting essentially, as calculated in weight percent on the oxide basis, of about 18–28% CaO, 9–15% La_2O_3, 9–15% TiO_2, 30–54% B_2O_3, and the remainder SiO_2, the SiO_2 content not exceeding 15% and the sum of $B_2O_3 + SiO_2$ being about 30–54%.

4,057,436

DISPERSION OF SOLIDS IN ORGANIC SOLVENTS

Peter Kingsley Davies; Leslie Richard Rogers; James Frederick Stansfield, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 15, 1975, Ser. No. 613,557

Claims priority, application United Kingdom, Aug. 1, 1975, 32287/75; Sept. 17, 1974, 40416/75; Sept. 17, 1974, 40418/75

Int. Cl.² C08K 5/34

U.S. Cl. 106—288 Q 3 Claims

1. A composition comprising a dispersion of from 5% to 70% by weight based on the total weight of the dispersion of a pigment or dyestuff with an average particle size of less than 20 microns in an organic liquid containing dissolved therein from 5% to 100% by weight based on the weight of the pigment or dyestuff of a polymeric or resinous dispersing agent in which the improvement comprises the presence in the dispersion of from 1% to 50% by weight based on the weight of the pigment or dyestuff of a fluidising agent which is a quaternary ammonium salt of a monomeric coloured acid wherein there are from 19 and up to 60 carbon atoms contained in the 4 chains attached to the N-atom of the quaternary ammonium ion.

4,057,437

CONTINUOUS BELT FILTER AND FILTRATION METHOD

Aloysius C. Kracklauer, Conroe, Tex., assignor to Sparkler Mfg. Co., Conroe, Tex.

Filed June 9, 1976, Ser. No. 694,166

Int. Cl.² C13D 3/16; B01D 33/02, 33/18, 33/34

U.S. Cl. 127—9 9 Claims

1. Apparatus for use in filtering fluids by a gravity filtration process, comprising:

an endless belt having a pair of parallel spaced-apart edges separated by a porous central portion which serves as a filtering media;

an extended portion mounted in sealing engagement with said belt along each of the edges thereof;

said extended portion including a shaped portion presenting a sealing surface, and a chain;

a cylindrical filter vessel comprised of spaced-apart, circular end members with at least one connecting member therebetween, said end members having

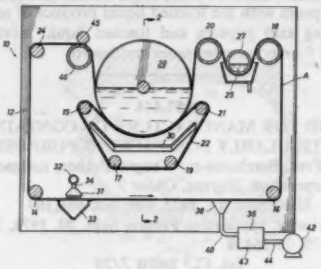
inner and outer surfaces, and a peripheral surface around the outer rim thereof;

guiding means around the circumference of said outer surface to mate with and guide said chain;

a machined portion on said peripheral surface, in leak-

proof sealing engagement with said sealing surface of said shaped portion;

wherein said filter belt may be removed from said extended



portions for replacement of cleaning, and whereby turning of said filter vessel acts to move said filter belt in a constant manner such that said belt is not stretched, wrinkled, or misaligned as the filtration process proceeds.

4,057,438

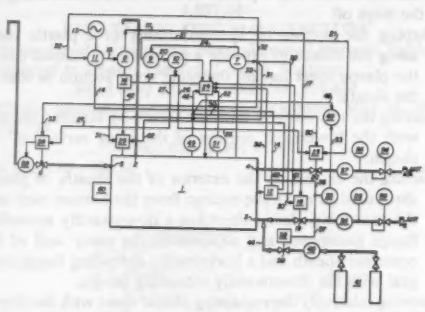
METHOD FOR HIGH TEMPERATURE CLEANING

Kenneth R. Mainord, 522 N. First, Apt. 105, Longview, Tex. 75601

Division of Ser. No. 474,916, May 31, 1974, Pat. No. 3,936,659. This application Nov. 3, 1975, Ser. No. 628,217

Int. Cl.[2] B08B *7/04*

U.S. Cl. 134—2 **5 Claims**



1. A method of cleaning glassware and metal parts in a high temperature oven, comprising the steps of:

purging said oven with an inert gas from a primary gas source to remove air,

circulating the existing atmosphere within the oven after purging with the inert gas,

heating the atmosphere within the oven to a pyrolyzing temperature with heaters connected to a heater controller,

pyrolyzing organic contaminants on articles to be cleaned for a preset pyrolyzing time,

purging the existing atmosphere within the oven with an air-inert gas mixture at the finish of the preset pyrolyzing time,

oxidizing residues by heating the existing atmosphere purged with an air-inert gas mixture to the oxidizing temperature of organic contaminants in the atmosphere for a preset time,

sensing flow of inert gas into the oven from the primary gas source by providing a pressure sensing device located between said oven and said primary gas source for deenergizing the heaters, sounding an alarm, and purging the oven with inert gas from an auxiliary inert gas source in response to detection of a failure of the primary gas source,

sensing the existing atmosphere within said oven to detect a combustible mixture during the pyrolyzing of organic contaminants by providing a combustible gas detector probe within said oven for terminating air flow, deenergizing the heaters and sounding an alarm in response to detection of a combustible atmosphere within the oven,

sensing the existing temperature in said oven during the pyrolyzing of organic contaminants and the oxidizing of residue by providing a temperature probe within said oven for deenergizing the heaters in response to overheating or rapid temperature changes in the oven.

4,057,439

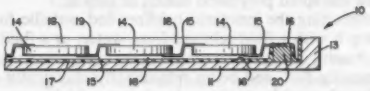
SOLAR PANEL

Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Filed Aug. 25, 1976, Ser. No. 715,407

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 P **8 Claims**



1. A solar panel for maintaining solar energy cells in position to receive light impinging thereon, comprising a tray within which said cells are mounted, said tray including side and end members and a base member having a substantially planar surface within the space bounded by said tray, a layer of cured, single component silicone resin adhesively adhered to said planar surface, a layer of cured, multi-component silicone resin adhered to said single component layer, said single component layer being thinner than said multi-component layer, and photovoltaic cells disposed within and encapsulated by said multi-component layer so that said cells are maintained by said panel in position to receive light impinging on surfaces thereof and convert such light into electrical energy while being protected from ambient conditions and delamination by said encapsulant.

4,057,440

SCALE REDUCER FOR ZINC PHOSPHATING SOLUTIONS

Thomas Clifford Atkiss, Pottstown, and William Elgin Keen, Jr., Flourtown, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 29, 1976, Ser. No. 653,679

Int. Cl.[2] C23F *7/10*

U.S. Cl. 148—6.15 Z **4 Claims**

1. In the process of phosphating iron, steel, galvanized steel and aluminum with an aqueous acidic zinc phosphating solution the improvement comprising adding a scale-reducing amount of dialkyl triamine pentakis methylene phosphonic acid or its alkaline salt in which the alkyl group ranges from C_2 to C_3 carbons and the salt is selected from the group consisting of sodium, potassium and ammonium.

4,057,441

SOLID PROPELLANT WITH BURNING RATE CATALYST

Richard A. Biddle, Newark, Del., assignor to Thiokol Corporation, Newtown, Pa.

Filed Apr. 20, 1976, Ser. No. 678,523

Int. Cl.[2] C06B *45/10*

U.S. Cl. 149—19.9 **5 Claims**

1. A solid propellant composition comprising a hydroxy terminated polybutadiene based binder component, an oxygen

containing inorganic oxidizer component, and finely divided cupric sulfide.

4,057,442

METHOD OF DISPOSAL OF PYROTECHNIC COMPOSITIONS

Graham C. Shaw, Garland, Utah; Emil A. Lawton, Sherman Oaks, Calif., and Leon L. Jones, Odgen, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Mar. 29, 1976, Ser. No. 671,478
Int. Cl.² C06B *23/00*
U.S. Cl. 149—109.4 19 Claims

1. A process for the disposal of a solid pyrotechnic composition substantially comprising a solid polymeric binder containing discrete particles of inorganic oxidizer and metallic fuel dispersed therein; and allowing for the recovery of said inorganic oxidizer and metallic fuel which comprises:

a. disrupting the matrix structure of said polymeric binder by treating said pyrotechnic composition with a swelling agent, or depolymerizing agent, substantially chemically unreactive with said inorganic oxidizer and said metallic fuel;

b. separating the inorganic oxidizer and metallic fuel from the disrupted polymeric matrix of step a;

c. contacting the inorganic oxidizer and metallic fuel from step b with a fluid selected from water, or a fluid having a density intermediate to that of the inorganic oxidizer and metallic fuel, and being substantially chemically unreactive therewith, to form a mixture which comprises, a solution of inorganic oxidizer and solid metallic fuel, or a layer of solid metallic fuel, a layer of said fluid of intermediate density and a layer of solid inorganic oxidizer; and

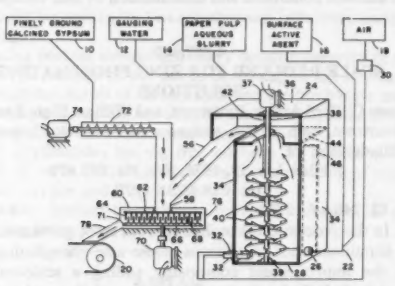
d. separating said mixture of step c.

4,057,443

FOAMED GYPSUM WALLBOARD

Rodney A. Stiling, Snyder; Edward A. Burkard, East Amherst, and Robert M. Johnson, Kenmore, all of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,239
Int. Cl.² B32B *5/20*
U.S. Cl. 156—43 5 Claims



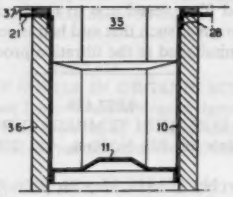
1. The continuous method of making lightweight gypsum wallboard in which a foam is continuously produced by foaming air bubbles in an aqueous solution of a surface active agent, comprising the steps of continuously admixing a surface active agent with a major portion of the water to be used in forming said gypsum wallboard, subjecting the said mixture to maximum turbulent flow agitation while simultaneously continuously adding air thereto, said subjecting to agitation including moving said mixture upward through a foam generator cell wherein said mixture is subjected to a plurality of spaced, coaxial, rotary high vaned blades each having a central disc portion and a plurality of teeth disposed around the periphery of said disc, said teeth extending out of the plane of said disc and having a relatively short leading edge and a relatively long trailing edge, said leading edge extending substantially perpendicularly from the plane of said central disc portion, said teeth being arranged relative to the disc periphery at an angle such that during rotation said teeth induce radially outward movement of said mixture, and subsequently admixing finely ground calcined gypsum with the foamed liquid product of said agitation, forming said gypsum and foamed liquid mixture into lightweight foamed core gypsum wallboard.

4,057,444

METHOD FOR MANUFACTURE OF CONTAINERS, PARTICULARLY FOR PACKING PURPOSES

Marcel G. Prot, Bercheres-sur-Vesgre, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Sept. 16, 1975, Ser. No. 614,169
Claims priority, application France, Sept. 20, 1974, 74.31886; Aug. 27, 1975, 75.26439
Int. Cl.² B65B *7/28*
U.S. Cl. 156—69 8 Claims



1. A method for the manufacture of a container comprising a cardboard sheath and a plastic bottom, the method comprising the steps of:

shaping the bottom by thermoforming of a plastic sheet using the sheath to provide a peripheral U-shaped rim in the plastic sheet having the same cross section as that of the sheath;

making the rim integral with the sheath by bonding the rim with the lowermost portion of the inner surface of the sheath;

parting the excess, on the exterior of the sheath, of plastic sheet used to make the bottom from the bottom such that the remaining plastic sheet has a downwardly extending flange juxtaposed and adjacent to the outer wall of the container sheath and a horizontally extending flange integral with the downwardly extending flange;

moving relatively the remaining plastic sheet with the downwardly depending flange and the sheath to position the downwardly depending flange about the outer topmost portion of te sheath; and

making the downwardly depending flange integral with the sheath by bonding the flange with the outer topmost portion of the sheath.

4,057,445

CLOSED TORUS TIRE

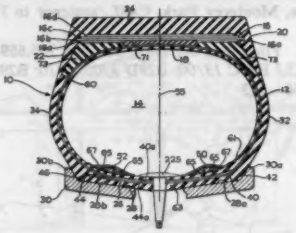
Max D. Brinkley, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,713
Int. Cl.² B29H *15/00, 17/02*
U.S. Cl. 156—121 15 Claims

1. The method of building a tire having a toric inflatable chamber comprising in combination the steps of:

forming a cylindrical sleeve including a ply of cord or wire ply stock, disposing a pair of parallel spaced apart inextensible hoops around one circumferential edge portion of the sleeve, moving the other circumferential edge portion of the sleeve radially outwardly and axially over the remaining portion of the sleeve to form and to locate a first sidewall of said tire, then moving said other circumferen-

tial edge portion radially inwardly of said one edge portion and axially through at least one of said hoops, and then disposing said other circumferential edge portion in lapping and contacting relation with and radially inwardly



of said one edge portion thereby to at least initiate between the respective edge portions a splice closing said toric inflatable chamber with said splice being disposed circumferentially of said chamber in the radially inward region of the tire and subsequently curing the tire.

4,057,446

PNEUMATIC TIRE MANUFACTURE

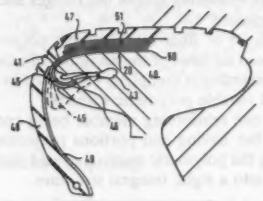
Anthony Gerald Goodfellow, Maghull, near Liverpool, England, assignor to Dunlop Limited, London, England

Filed May 21, 1975, Ser. No. 579,424

Claims priority, application United Kingdom, May 28, 1974, 23575/74

Int. Cl.² B29H *17/04*

U.S. Cl. 156—123 R **5 Claims**



1. A method of manufacturing at least a portion of a pneumatic tire, comprising:

a. locating an annular, substantially inextensible breaker on the radially outer surface of a former, the former including an at least substantially solid annulus which is of greater axial length than radial thickness in radial cross-section and which is of an elastomeric material which yields to permit the diameter of the former to be increased or decreased;

b. increasing the diameter of the former to stretch the breaker;

c. locating the former with the breaker in the stretched condition thereon in a mould;

d. moulding a tire tread portion over the stretched breaker;

e. moulding a tire sidewall in contact with the tread portion;

f. curing the moulded tire tread and sidewall; and

g. removing the former from the interior of the cured tire tread and sidewall.

4,057,447

MANUFACTURE OF PNEUMATIC TIRES

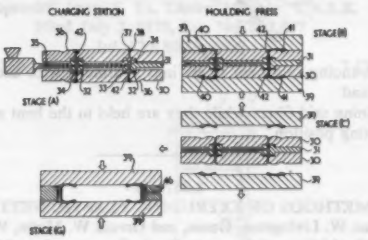
Eric Holroyd, High Legh Park, near Knutsford; Anthony Gerald Goodfellow, Maghull, near Liverpool, and James Neil McGlashen, Winstanley, near Wigan, all of England, assignors to Dunlop Limited, England

Continuation of Ser. No. 348,654, April 6, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,461

Claims priority, application United Kingdom, Apr. 6, 1972, 15787/72

Int. Cl.² B29H *17/00*

U.S. Cl. 156—125 **17 Claims**



1. A method for the manufacture of a pneumatic tire having parts including beads, sidewalls and a tread portion reinforced by means of a breaker assembly, comprising the following steps:

a. working curable but uncured rubber to an extent sufficient to destroy its nerve but not to start the rubber on to a curing cycle;

b. preassembling a breaker assembly for the tread portion of the tire and positioning it in an annular mould cavity for the tread portion of the tire;

c. forming the tire in three parts from said worked uncured rubber by forcing said rubber into annular mould cavities including the mould cavity for the tread portion of the tire in which said breaker assembly has been preassembled, and mould cavities for the sidewall and bead on each side of the tire, at least the sidewall and bead moulds each being provided with gas-tight locking spures to assist in maintaining a formed tire in a desired part of each of the latter moulds when the latter moulds are opened;

d. opening the moulds for the tire parts, at least the moulds for the sidewalls being opened in a pressurized atmosphere such that gas under pressure flows between parts of the moulds for the sidewalls and is prevented by the gas-tight locking sprues from passing around one side of each of the formed tire sidewalls whereby the tire sidewalls are retained in desired parts of the sidewall moulds;

e. reassembling the moulds for the tire parts into a tire mould to bring the tire parts into joining contact; and

f. joining the parts of the tire under head and gas pressure.

4,057,448

OPTICAL FIBER SPLICING TECHNIQUE

Calvin Max Miller, Lilburn, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 521,656, Nov. 7, 1974, Pat. No. 3,919,037. This application Aug. 26, 1975, Ser. No. 607,777

Int. Cl.² B65H *69/06*

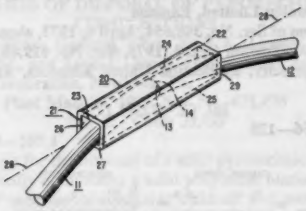
U.S. Cl. 156—158 **12 Claims**

1. A method of joining the mating ends of a pair of optical fibers comprising the steps of:

inserting said fibers into opposite ends of a loose-fitting optical fiber receiving tube being capable of rotating about its longitudinal axis and having a uniform interior cross section comprising at least one corner, said corner forming a fiber-aligning groove in the interior surfaces of said tube substantially parallel to said longitudinal axis;

bending said fibers with respect to said longitudinal axis to

bias said fibers against said interior surfaces, said biasing generating sufficient forces to rotate said tube until said mating fiber ends are lodged against said fiber-aligning groove to effect transverse alignment of said fibers;



advancing said bent fibers into abutment with each other; and

joining said fibers while they are held in the bent and abutting position.

4,057,449

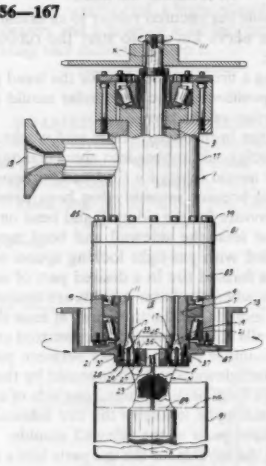
METHODS OF EXTRUDING PLASTIC NETTING

Wayne W. Livingston, Osseo, and Gerald W. Melin, Wyoming, both of Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Division of Ser. No. 450,859, March 13, 1974, Pat. No. 3,957,565. This application Mar. 1, 1976, Ser. No. 662,530

Int. Cl.[2] D04H *3/16*

U.S. Cl. 156—167 **2 Claims**



1. The method of extruding tubular plastic netting comprising extruding a first generally circular series of filaments with each of the filaments inclined in one direction with respect to a plane including the longitudinal axis of the netting, extruding a second generally circular series of filaments concentric with the first and each inclined in the opposite direction with respect to said plane including the longitudinal axis of the netting, and rotating the first and second series in opposite directions, said first and second series being rotated in such direction that the filaments trail in respect to their respective direction of rotation, the angular velocity of the filaments of the first series and the rate of extrusion of the first series being so related that the resultant horizontal velocity of the filaments of the first series upon extrusion relative to a stationary point is approximately zero, the angular velocity of the filaments of the second series and the rate of extrusion of the second series being so related that the resultant horizontal velocity of the filaments of the second series upon extrusion relative to a stationary point is approximately zero, the filaments of the first and second series being joined at intersections thereof.

4,057,450

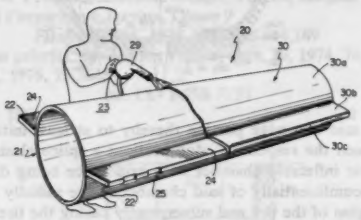
METHOD FOR MAKING BUOYANCY MEMBERS

George Lee, Monterey Park, Calif., assignor to Hitco, Irvine, Calif.

Filed Dec. 30, 1976, Ser. No. 755,659

Int. Cl.[2] B29C *13/00*; B29D *3/02, 9/10*; B29G *7/07*

U.S. Cl. 156—213 **9 Claims**



1. A method for producing buoyancy members in the form of a segment of a hollow cylinder, comprising:

forming a bendable, curable layer of fiber-filled polymeric material on exterior surfaces of a cylindrical mold, said mold having two longitudinal, radially extending flanges spaced about its circumference, said surfaces including a surface between said flanges and surfaces of said flanges, said layer terminating in overhanging portions along outer edges of the flanges; assembling on said curable layer a plurality of elongated hollow, rigid, tubular elements in side-by-side relationship to form an assembly with the assembly of tubular elements filling the space between the portions of the curable layer carried by the flanges; bending the overhanging portions of said curable layer to overlie adjacent surface portions of the assembly of tubular elements;

applying at least one flexible reinforcing member transversely across the assembly of tubular elements with the reinforcing member extending across the flanges and being maintained under tension;

applying a layer of fiber-filled curable polymeric material over exposed surfaces of the assembly of tubular elements until the assembly is completely enclosed in a shell of the fiber-filled curable polymeric material,

said at least one reinforcing member being enclosed within said shell but having end portions projecting therefrom; and curing the polymeric material of said shell, converting said shell into a rigid, integral structure.

4,057,451

MIRROR MOUNT APPLYING METHOD

Robert R. Beckham, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

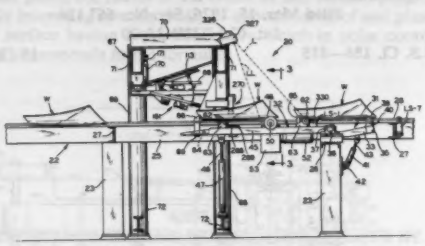
Division of Ser. No. 545,529, Jan. 30, 1975, Pat. No. 3,948,719. This application Jan. 26, 1976, Ser. No. 652,609

Int. Cl.[2] B32B *31/20*; B65H *7/20, 29/00*

U.S. Cl. 156—320 **4 Claims**

1. A method of affixing a mirror mount on one surface of a glass sheet comprising: supporting a glass sheet having reference indicia thereon in a generally horizontal plane, providing a movable carriage above said glass sheet, said carriage having a press member, a supply of mirror mounts and an indicia detecting means carried thereon, each of said mirror mounts being provided with an outer plastic layer affixed thereto, feeding a single mirror mount from said supply to said press member, heating said mirror mount substantially to the softening point of said plastic layer during the transit of said mount from said supply to said press member, traversing said carriage

across said glass sheet and moving said detecting means therewith to detect said reference indicia, generating a signal upon detection of said reference indicia, controlling movement of said carriage in response to said signal to orient said press



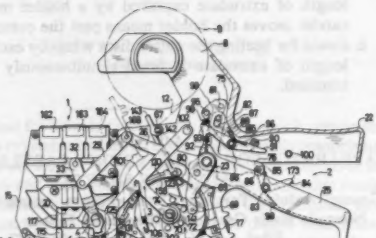
member and thereby said heated mirror mount in a desired relation to said reference indicia, and actuating said press member upon attainment of said desired relation to apply said mirror mount in a desired region on said glass sheet.

4,057,452

CONSTANT PRESSURE MECHANISM FOR HAND LABELER

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Sept. 2, 1976, Ser. No. 720,225
Claims priority, application Japan, Sept. 5, 1975, 50-107120
Int. Cl.² B41F *1/08, 1/38, 1/44*
U.S. Cl. 156—384 **31 Claims**



1. A hand labeler comprising:

a frame;

a printing device fixedly mounted on said frame;

a platen assembly for carrying a label strip, and supported in said frame and positioned such that a label on said platen assembly confronts said printing device;

a hand lever for being operated to move said platen assembly; platen assembly operating means for operatively connecting said hand lever and said platen assembly and for rapidly moving said platen assembly against said printing device with the label on said platen assembly; biasing means connected with said platen assembly operating means for causing said platen assembly operating means to rapidly move said platen assembly with a constant printing pressure against said printing device; said biasing means being connected with said hand lever for being charged by movement of said hand lever and for thereafter being released to discharge and cause said platen assembly operating means to move said platen assembly following further movement of said hand lever;

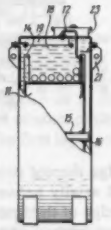
means for retracting said platen assembly from said printing device; disconnect means for disconnecting said biasing means from said platen assembly operating means prior to said retracting means retracting said platen assembly.

4,057,453

METHOD FOR MANUFACTURING AND LAYING OUT PHASE CORES FOR OIL-FILLED CABLES AND A DEVICE FOR ACCOMPLISHING SAME

Mikhail Kirillovich Bataev; Isaak Efimovich Veits; Sergei Sergeevich Gorodetsky; Lev Ilich Macheret; Lev Alexeevich Kuznetsov; Albert Vasilievich Tjurin, and Jury Eduardovich Yaunzem, all of Moscow, U.S.S.R., assignors to Vsesojuzny Proektno-Izyskatelsky Nauchno-Issledovatelsky Institut "Gidroproekt" imeni S. Ya. Zhuka, Moscow, U.S.S.R.

Filed July 2, 1975, Ser. No. 592,667
Int. Cl.² B32B *1/00*
U.S. Cl. 156—390 **7 Claims**



1. A device for manufacturing phase cores of oil-filled cables comprising: a twisting machine used to obtain a current-carrying core by means of twisting together a number of individual wires, an insulating machine used to apply paper insulation onto said current-carrying core, a vacuum drier, an instrumentation means for making electrical measurements and insulation tests, a drum to receive the insulated current-carrying core, a container for said drum, wherein said drum is installed in said container for rotation, said container serving as a provisional sealed housing where the cable phase core is dried, impregnated with an insulating compound, subjected to electrical measurements and insulation tests and pressurized, wherein said container is provided with a means compensating for temperature variations of the volume of said cable phase core and said insulating compound located inside said container comprising an elastic partition dividing said container into a conserving chamber filled with an insulating compound to protect the insulation of the cable phase core from humidity effects, and a compensating chamber to compensate for temperature variations of the volume of said insulating compound and said cable phase core wherein the cavity of the drum is made airtight and has access to said compensating chamber of said container.

4,057,454

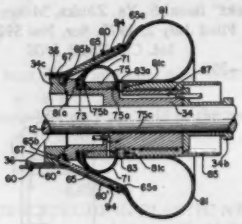
MANDREL FOR FABRICATING AN AIR SPRING

Michael W. Smith, Mogadore, and Stanley J. Houck, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 24, 1976, Ser. No. 717,734
Int. Cl.² B23B *31/40*; B29H *17/22*
U.S. Cl. 156—401 **8 Claims**

1. Apparatus for fabricating an air spring prior to its being shaped and cured, the air spring having an inextensible ring enfolded coaxially thereof in each of its axial ends, the apparatus comprising means defining a straight cylindrical surface axially coextensive with said air spring between said axial ends, said means including a fixed diameter portion and a variable diameter portion, the variable diameter portion comprising a multiplicity of axially extending fingers each having one end fixed radially adjacent one end of the fixed diameter portion and another end movable radially outward relative to its fixed

end, each said other end having a notch, the plurality of notches cooperating to form a circumferential groove coaxially about said cylindrical surface and open radially outwardly thereof, a rigid body coaxially supporting said means, an inflatable sleeve having two circular edges secured to said rigid body axially between the inward end and the outward end of and radially inward of said fingers and passage means disposed in said rigid body for connecting said sleeve with compressed air whereby said members are moved arcuately outwardly in response to inflation of said sleeve, and a further inflatable sleeve having its two circular edges secured coaxially to said



rigid body one edge thereof being secured radially inward of said members and axially between the inner end thereof and the axially inner edge of the first-mentioned bladder, the outer of said edges being secured axially outward of the first-mentioned bladder, and the sleeve extending axially outward from its one edge to a circumferential bight and thence axially inward to the other of its edges, and said passage means separately connecting the latter said sleeve with compressed air whereby the latter said sleeve is expanded in response to said air radially outwardly of the outer ends of said fingers while the same are in their radially expanded position.

4,057,455

TIRE STITCHING APPARATUS

Karl W. Klose, Findlay, Ohio, assignor to Cooper Tire and Rubber Company, Findlay, Ohio

Filed Mar. 11, 1975, Ser. No. 557,337
Int. Cl.² B29H *17/18*
U.S. Cl. 156—410 **7 Claims**

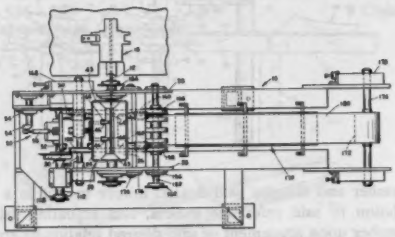
1. An apparatus for stitching on a tire building drum having rounded shoulders a plurality of superimposed rubberized fabric sheets, said apparatus comprising a pair of base members, means for moving said base members in opposite directions along a linear path parallel to the axis of rotation of said drum, a platform arranged in spaced parallel relation to each base member and pivotally connected thereto, a stitcher wheel pivotally connected to each platform, means carried by each platform for moving said stitcher wheel into and out of engagement with said drum, a driven member provided on each platform, and driving means mounted on said base members and engaging said driven member for rotating said platform about said pivotal connection and moving said stitcher wheels over said drum and rounded shoulders.

4,057,456

APPARATUS FOR TRIMMING AN EXTRUDATE

Charles Gwin Renegar, and Frank Edward Colbeck, both of Shelbyville, Tenn., assignors to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Mar. 15, 1976, Ser. No. 667,116
Int. Cl.² B32B *31/00*
U.S. Cl. 156—515 **15 Claims**



1. Apparatus for trimming an extrudate to finished length and fusing the ends thereof, comprising:

a. hopper means for receiving and orienting rough-cut lengths of extrudate, and having an outlet through which oriented lengths of extrudate are adapted to pass;

b. a movable carrier having a plurality of spaced holder means operatively passing the outlet as the carrier moves;

c. each holder means adapted to releasably capture a length of extrudate from the outlet as the carrier moves the holder means past the outlet;

d. a pair of spaced, rotatable cutter discs operatively positioned relative to the carrier for trimming each end of a length of extrudate captured by a holder means as the carrier moves the holder means past the cutter, discs and

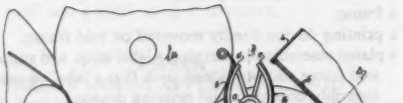
e. means for heating the cutter discs whereby each end of the length of extrudate is fused simultaneously with being trimmed.

4,057,457

APPARATUS FOR TRANSFERRING LABELS OR LIKE FLEXIBLE SHEETS

Georges Antoine Tavernier, Lyon, France, assignor to Societe Nouvelle Baele Gangloff, Villeurbane, France

Filed Aug. 5, 1976, Ser. No. 711,877
Claims priority, application France, Aug. 5, 1975, 75.25010
Int. Cl.² B65C *9/08*
U.S. Cl. 156—571 **6 Claims**



1. In an apparatus for transferring flat flexible sheets which comprises a turntable, means for rotating said turntable about a turntable axis, a stationary magazine holding a stack of sheets adjacent said turntable, at least one pickup head on said turntable about a pickup axis spaced from the said turntable axis and having a curved pickup surface engageable with a sheet of said

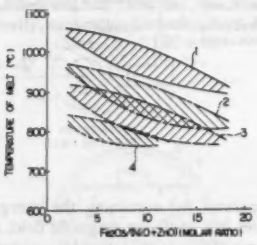
stack, and means for rotating said head about an axis parallel to the axis of said turntable, the improvement wherein said pickup surface has an axial plane of symmetry extending through the axis of rotation of said head and a smallest radius of curvature at said plane, the radius of curvature of said surface progressively increasing symmetrically to opposite sides of said plane, said surface having a directrix curve which in polar coordinates corresponds to the formula:

$$r = \frac{A^2 - R^2}{A \cdot \cos\left(\frac{\pm\theta\sqrt{A^2 - R^2}}{(A)}\right) + R}$$

4,057,458
METHOD OF MAKING NICKEL ZINC FERRITE BY LIQUID-PHASE EPITAXIAL GROWTH

Kunihiro Maeda; Hiromichi Imahasi, both of Hitachi, and Matsunosuke Kikuchi, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 15, 1975, Ser. No. 613,502
Claims priority, application Japan, Sept. 17, 1974, 49-106079
Int. Cl.² B01J *17/04, 17/34*
U.S. Cl. 156—603 **4 Claims**



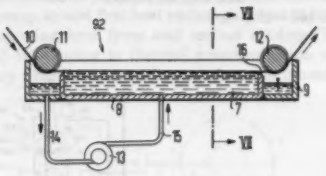
1. A method for forming nickel zinc ferrite, which comprises immersing a crystal substrate in a supercooled melt comprising lead oxide, iron oxide, 6% by weight or less of boron oxide or lead fluoride, and such amounts of nickel oxide and zinc oxide that the molar ratio ZnO/(NiO + ZnO) is 0.8 or smaller and then in a supercooled melt comprising lead oxide, iron oxide, zinc oxide, and 6% by weight or less of boron oxide or lead fluoride to form by epitaxial growth at least two layers of nickel zinc ferrite and zinc ferrite on said substrate, and then converting the resulting layers into a nomogeneous single layer of nickel zinc ferrite by thermal diffusion treatment.

4,057,459
METHOD FOR MANUFACTURING MICRO-WIRING ARRANGEMENTS FOR CONTACTING SEMICONDUCTOR CIRCUITS

Gerhard Mitterhummer, Munich, and Kurt Plehnert, Pullach, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 24, 1975, Ser. No. 616,148
Claims priority, application Germany, Sept. 27, 1974, 2446368; July 2, 1975, 2529576
Int. Cl.² C23F *1/02*
U.S. Cl. 156—630 **7 Claims**

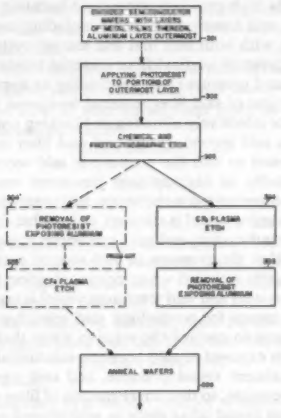
1. In a method of manufacturing micro-wiring arrangements on a flexible, insulating carrier band for the purpose of contacting semiconductor circuits, said method including providing a flexible carrier band having at least one opening therethrough for receiving an assembly, a metal layer bonded to one side of the carrier band with a first layer of photosensitive varnish covering the metal layer and a second layer of photosensitive varnish covering the other side of the carrier band and any portion of the metal layer exposed through each opening in the band, and forming a wiring structure in the metal layer by using photo-etching techniques including exposing the first layer of photosensitive varnish with the desired pattern and developing the exposed first layer prior to an etching step, the improvements comprising said step of developing the exposed first layer of photosensitive varnish being accomplished without developing the second layer of photosensitive varnish by floating the band on a surface of a developer bath with the first layer contacting the surface of the bath and creating a flow within the bath of the developer in a direction generally toward said first layer to insure contact of the first layer and to thereby cause developing of the first layer to uncover portions of the metal layer.



4,057,460
PLASMA ETCHING PROCESS

Arjun N. Saxena, Palo Alto, and Courtney Hart, San Jose, both of Calif., assignors to Data General Corporation, Westboro, Mass.

Filed Nov. 22, 1976, Ser. No. 743,734
Int. Cl.² C23F *1/02*
U.S. Cl. 156—643 **7 Claims**


APPLYING PHOTORESIST TO PORTIONS OF OUTERMOST LAYER
REMOVAL OF PHOTORESIST EXPOSING ALUMINUM
CF4 PLASMA ETCH
CF4 PLASMA ETCH
REMOVAL OF PHOTORESIST EXPOSING ALUMINUM
ANNEAL WAFERS

5. A process for plasma etching a semiconductor wafer having metallic layers deposited thereon, which process inhibits the build-up of space charge effects otherwise created by interactions between said plasma and the outermost one of said metallic layers, said process comprising the steps of:

a. first, insulating a portion of the outermost of said layers from etching effects of said plasma in order to reduce interference by atomic effects of said outermost of said layers with said etching effects;

b. second, subjecting said wafer to said etching effects and removing said wafer therefrom after a predetermined etching result has been obtained; and

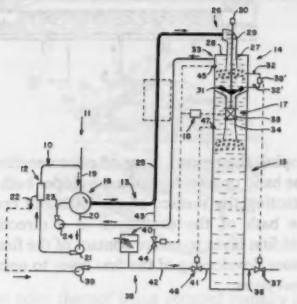
c. third, removing insulation applied in said insulating step thereby exposing said portion of said outermost of said layers, along with said obtained etching result.

4,057,461

METHOD AND APPARATUS FOR IMPREGNATION OF FIBER MATERIAL BY PRESSURE PULSATION

Johan C. F.C. Richter, Nice, France, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Filed Aug. 27, 1976, Ser. No. 690,786
Claims priority, application Sweden, June 2, 1975, 7506255
Int. Cl.² D21C 3/26, 7/00
U.S. Cl. 162—19 **15 Claims**



1. Apparatus for impregnating fiber material with treatment liquid before treatment thereof, comprising

a. a first means defining a relatively low pressure system, including fiber material in impregnation liquid;

b. means for continuously removing liquid from said first system to maintain said system at relatively low pressure;

c. means for transferring fiber material in impregnation liquid in said first system to a second means defining a relatively high pressure system and boosting the pressure thereof, said transferring means including means communicating with both said first and second systems;

d. a high pressure vertical fiber material treatment vessel;

e. said second pressure system including an upper impregnation portion of said fiber material treatment vessel;

f. means for selectively allowing or blocking communication between said second system and said fiber material treatment vessel so that the pressure in said second system is substantially as high as said treatment vessel pressure when communication between said second system and said treatment vessel is allowed, and so that the pressure in said second system and said treatment vessel is allowed, and so that the pressure in said second system becomes significantly reduced when communication between said second system and said treatment vessel is terminated; and

g. timing means for controlling said selective communication means to control the relative times that said second system is exposed to said pressure substantially as high as said treatment vessel pressure, and said significantly reduced pressure, so that impregnation of fiber material with treatment liquid takes place in said second system.

8. A method of impregnating fiber material with treatment liquid before treatment thereof in a high pressure treatment vessel having an upper impregnation chamber comprising the steps of

a. establishing a first flow system of fiber material and treatment liquid under relatively low pressure;

b. continuously withdrawing liquid from said first system so that the pressure therein is reduced unless supplemental liquid is provided;

c. establishing a second flow system of fiber material and treatment liquid under relatively high pressure;

d. transferring fiber material in treatment liquid in said first system to said second system and boosting the pressure thereof, said second system including the impregnation chamber of the fiber material treatment vessel;

e. selectively allowing or blocking communication between said second system and said treatment vessel so that the pressure in said second system is substantially as high as said treatment vessel pressure when communication between said second system and said treatment vessel is allowed, and so that the pressure in said second system becomes significantly reduced when communication between said second system and said treatment vessel is blocked; and

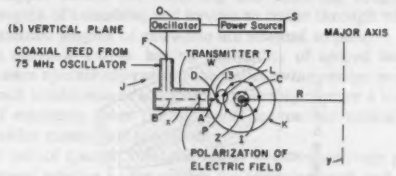
f. controlling the time that communication between said second system and said treatment vessel is effected to control the relative times that said second system is exposed to high and low pressure so that impregnation of fiber material with treatment liquid takes place in said second system.

4,057,462

RADIO FREQUENCY SUSTAINED ION ENERGY

Daniel L. Jassby, and William M. Hooke, both of Princeton, N.J., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 26, 1975, Ser. No. 553,196
Int. Cl.² H01J 37/00; G21B 1/00
U.S. Cl. 176—5 **1 Claim**



1. In an apparatus for sustaining the energy of ordered charged particles in a confining magnetic field, comprising:

a. means for creating a neutral, two-ion-species, equilibrium, bulk plasma column in a closed toroidal magnetic confinement having helical magnetic field lines for confining both the ordered and equilibrium plasma particles;

b. means containing titanium dioxide for injecting rf resonant energy into the plasma transverse to the axis of the plasma column in resonance with the natural frequency of one of the ions species; and

c. means for injecting colliding, neutral, ordered beams having stored energy into the confined plasma particles to produce colliding, suprathermal ions whose energy and direction are ordered, opposite and confined by the helical magnetic field lines, and

d. said rf energy is injected to sustain the energy of the colliding beams against plasma drag.

4,057,463

METHOD OF OPERATING A NUCLEAR REACTOR WHICH MAINTAINS A SUBSTANTIALLY CONSTANT AXIAL POWER DISTRIBUTION PROFILE WITH CHANGES IN LOAD

Toshio Morita, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

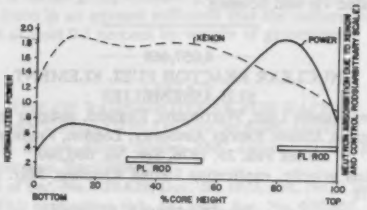
Filed Aug. 29, 1974, Ser. No. 501,569
Int. Cl.² G21C 7/08
U.S. Cl. 176—22 **16 Claims**

1. A method of operating a nuclear reactor having a reactive core including fissile material with an axial dimension and adjustable control means for controlling the reactivity within the core, comprising the steps of:

monitoring a parameter representative of the power generated within the core at a first and second axial location;

obtaining from the core power parameters measured at said first and second axial locations a representation of the axial power distribution within the core; and

adjusting the control means to produce an axial power distribution to maintain a uniform and symmetric xenon distribution above and below substantially the center of the core over a substantial axial length of the core during normal reactor operation including load follow.

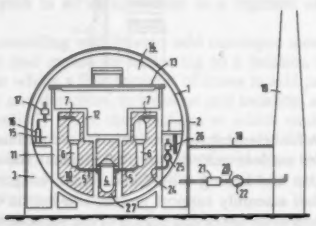


4,057,464

NUCLEAR REACTOR INSTALLATION

Georg Mair, and Hans-Peter Schabert, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 29, 1974, Ser. No. 501,761
Claims priority, application Germany, Sept. 17, 1973, 2346726
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—37 **10 Claims**



1. A nuclear reactor installation comprising a reactor building forming a containment which is closed during reactor operation and internally defines an equipment zone containing radiating components and an operating zone which is accessible to workmen, and having a system for providing an atmospheric overpressure in the operating zone relative to the atmospheric pressure in the equipment zone; wherein the improvement comprises said system having means for removing a flow of atmosphere from said equipment zone, filter means for filtering said flow, and means for introducing a flow of the atmosphere filtered by said filter means to said operating zone under said overpressure.

4,057,465

NUCLEAR REACTOR AUXILIARY HEAT REMOVAL SYSTEM

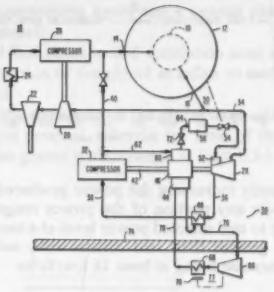
Robert E. Thompson, Bethel Park, and Bill L. Pierce, Whitehall Borough, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1975, Ser. No. 603,072
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—38 **16 Claims**

1. An auxiliary heat removal system for use in a gas-cooled nuclear reactor system to remove residual heat retained in the reactor core after reactor shutdown comprising:

a first recycling flow loop for conducting gaseous primary cooling fluid heated by said reactor core, said first flow loop including said reactor core, a gas turbine, a first heat exchanging means, and a compression means connected in series therein, and first conduit means for transporting said primary fluid from said core to said gas turbine, said first heat exchanging means, and said compression means in series, and for returning said primary fluid to said reactor core;

a second flow loop for conducting a second cooling fluid, said second flow loop including a fluid pump, second conduit means for transporting said second fluid from said fluid pump to said first heat exchanging means, and means for removing heat from said second cooling fluid, said second fluid being in thermal communication with said primary fluid in said first heat exchanging means;



said fluid pump and said compression means being mechanically coupled to, and driven by, said gas turbine; and

starter means for initiating operation of said gas turbine, said starter means being responsive to preselected conditions of said nuclear reactor system and comprising:

a pneumatic starter;

a container of starter fluid in fluid communication with said starter, said starter fluid being pressurized within said container, and;

a starter valve disposed in the flow path between said pneumatic starter and said container, said starter valve controlling the flow of said starter fluid from said container to said pneumatic starter.

4,057,466

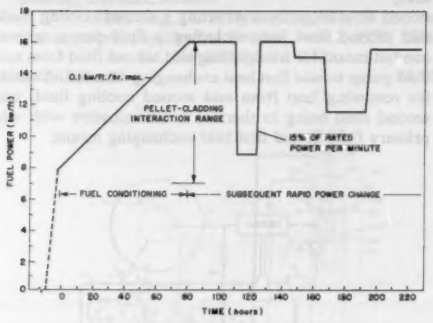
CONDITIONING OF NUCLEAR REACTOR FUEL

John Robert Thompson, San Jose, Calif.; Trevor Cartwright Rowland, Halden, Norway; Richard Alan Proebstle, San Jose, Calif.; Edward Rosicky, Fremont, Calif., and Thoma Mees van't Hoff Snyder, Los Altos, Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 460,298, April 12, 1974, abandoned.
This application Feb. 23, 1976, Ser. No. 660,506
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—38 **15 Claims**

1. In a fuel core of a nuclear reactor wherein said fuel consists of a plurality of cylindrical pellets of fuel in oxide form of about 0.49 inches in diameter contained in a plurality of elongated zirconium alloy cladded tubular fuel elements with a cladding thickness of about 0.032 inches and having a range of power output and a maximum power rating, a method of conditioning said fuel elements to withstand subsequent rapid power changes without cladding failure comprising: (1) increasing the power produced by said fuel elements through a fuel pellet-cladding interaction range of power wherein expansion of said pellets and consequent pellet-cladding interaction causes said pellets to exert forces upon said cladding to a selected power level no greater than said maximum power level at a first rate of power increase below a critical rate which causes cladding damage due to said fuel pellet-cladding interaction, said critical rate being about 0.125 kw/ft/hr, and stepwise increases in power at said first rate comprising steps no greater than about 0.5 kw/ft, whereby said fuel elements are

conditioned for subsequent rapid power changes up to said desired power level with minimized danger of cladding damage; (2) decreasing the power produced by said fuel elements from said selected power level to a lower power level; and (3)



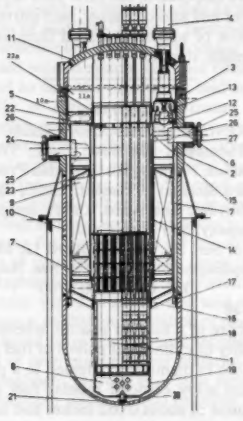
subsequently increasing the power produced by said fuel elements over any portion of the power range of said fuel elements up to said selected power level at a second rate of power increase greater then said critical rate, said second rate of power increase being at least 16 kw/ft/hr.

4,057,467

INTEGRATED PRESSURIZED-WATER REACTOR AND STEAM GENERATOR

Siegfried Kostrzewa, Bruckfeld, Germany, assignor to Interatom, Internationale Atomreaktorbau GmbH., Cologne, Germany

Filed Aug. 28, 1975, Ser. No. 608,755
Claims priority, application Germany, Sept. 5, 1974, 2442500
Int. Cl.[2] G21C *15/00*
U.S. Cl. 176—65 **8 Claims**



1. An integrated pressurized-water reactor and steam generator combination comprising a pressure vessel having an inside with upper and lower portions, said lower portion including a vertical surface, and internals in said inside and including a core in said lower portion, coolant circulating pumps in said upper portion and having coolant intakes, and a steam generator interposed between said core and said intakes, said internals being removable from said vessel without their destruction; wherein the improvement comprises a hollow ring connected with and supported by said upper portion, and a hollow cylindrical housing having an upper end connected to said hollow ring and suspended thereby, said housing having coolant flow openings and said steam generator being positioned in and supported by said housing said housing being free to expand downwardly from said hollow ring and all said internals being suspended via said housing.

4,057,468

NUCLEAR REACTOR FUEL ELEMENT SUB-ASSEMBLIES

Anthony Randle Lunt, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 23, 1976, Ser. No. 660,280
Claims priority, application United Kingdom, Mar. 3, 1975, 8791/75
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—78 **3 Claims**

1. A fuel element sub-assembly for a liquid metal cooled fast breeder nuclear reactor, the fuel element sub-assembly being elongate and having a base end region adapted for plugging into fuel assembly support means, and inertia damping means disposed at an upper end region of the sub-assembly, the inertia damping means comprising:

a lower sleeve rigidly attached to the fuel element sub-assembly;

a tubular spine rigidly and co-axially attached to the lower sleeve;

an upper sleeve mounted co-axially on the tubular spine with a radial spacing therebetween and resiliently coupled to the lower sleeve, the upper sleeve having coolant flow ducts extending therethrough to the radial clearance.

4,057,469

PROCESS FOR THE MICROBIOLOGICAL OXIDATION OF STEROIDS

Daikichiro Nishikawa, Tokyo; Yukio Imada; Masayuki Kinoshita, both of Yokohama; Katsuhiko Takahashi, Kawasaki; Hajime Machida, Tokyo, and Michitaro Nagasawa, Noda, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed June 7, 1976, Ser. No. 693,685
Claims priority, application Japan, June 6, 1975, 50-68379; Sept. 22, 1975, 50-114431
Int. Cl.[2] C07B *29/02*
U.S. Cl. 195—51 G **21 Claims**

1. In a process for the production of 17-hydroxyandrosta-1,4-dien-3-one and/or androsta-1,4-diene-3,17-dione by fermenting a sterol, its 4-en-3-one sterol derivative or its 1,4-dien-3-one sterol derivative in a culture medium containing a chelating agent capable of forming a chelating compound with iron and copper ions with a microorganism capable of microbiologically oxidizing said sterol or its derivatives to produce 17-

hydroxyandrosta-1,4-dien-3-one and/or androsta-1,4-diene-3,17-dione, the improvement which comprises adding to the culture medium at least one glyceride-containing substance selected from the group consisting of glycerides, fats, oil seeds and oil fruits in an amount sufficient that the culture medium contains at least 0.3 percent by weight of glycerides.

4,057,470
USE OF RADIOISOTOPES FOR RAPID IDENTIFICATION OF MICROORGANISMS

Joseph R. Schrot, Silver Spring, Md., assignor to Biospherics Incorporated, Rockville, Md.

Division of Ser. No. 429,629, Dec. 28, 1973, Pat. No. 3,969,496. This application Feb. 18, 1976, Ser. No. 658,859
Int. Cl.² C12K *1/04*
U.S. Cl. 195—127 **6 Claims**

1. An apparatus for identifying a microorganism from radioactive trace material comprising the combination of

means for individually incubating samples of the microorganism with a plurality of preselected substrates each having radioactive trace material therein;

means for collecting gaseous material evolved from the means for incubating in zones arranged in a predetermined pattern, said means for collecting being removable from said means for incubating after incubation;

means for storing a plurality of said means for collecting after removal thereof from said means for incubating;

a plurality of radioactive particle detectors;

conveyor means for individually transporting said means for collecting from said means for storing along a path;

means for mounting said radioactive particle detectors adjacent said path in an array similar to a segment of said pattern;

means for controlling and driving said conveyor means to move each said means for collecting to a location along said path at which a first segment of zones in said pattern is adjacent said detectors, to pause at said location, and to then sequentially move the positions at which each segment of zones are successively exposed to said detectors;

means electrically connected to each of said detectors for accumulating a count of radioactive particles detected by each detector at each zone;

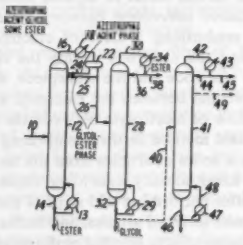
means for storing a record of counts representative of known microorganisms incubated in known substrates;

means for comparing a plurality of said known counts with a plurality of counts derived from said detectors and for displaying the results of the comparisons.

4,057,471
RECOVERY OF ALKYLENE GLYCOLS

Chun Fei Chueh, Jamaica, N.Y., assignor to Halcon International, Inc., New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,825
Int. Cl.² B01D *3/36*
U.S. Cl. 203—69 **11 Claims**



1. A process for recovering ethylene glycol or propylene glycol from a mixture comprising propylene glycol or ethylene glycol in admixture with at least one of a mono-lower carboxylate ester and a di-lower carboxylate ester of said propylene glycol or ethylene glycol which comprises the steps of:

a. subjecting said mixture to distillation in a distillation zone in the presence of an azeotroping agent effective to form a minimum-boiling azeotrope with said glycol, said azeotroping agent being essentially water and glycol immiscible and having a boiling point at atmospheric pressure of above 135° to about 220° C, whereby an overhead product and a bottoms product are produced, said overhead product comprising said azeotroping agent and said glycol and said bottoms product comprising said ester substantially reduced in glycol content;

b. separating said overhead product into a first phase comprising said azeotroping agent and a second phase comprising said glycol;

c. returning said first phase to said distillation zone as reflux;

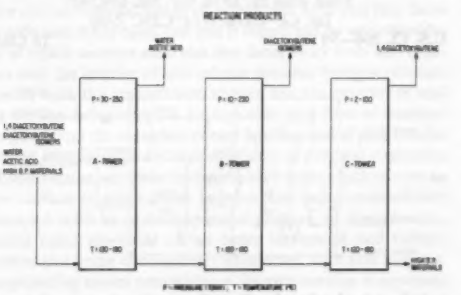
d. supplying a portion of the glycol as reflux to said distillation zone; and

e. withdrawing the remainder of the glycol from said second phase as glycol product, wherein the ratio of the glycol supplied to the glycol withdrawn is at least 0.3:1.

4,057,472
METHOD OF SEPARATING DIACETOXYBUTENE

Jun Toriya; Masato Sato; Ken Shiraga, and Setsuo Matsunaga, Noboru Haji, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 557,260, March 11, 1975, abandoned. This application Feb. 6, 1976, Ser. No. 656,011
Claims priority, application Japan, Mar. 12, 1974, 49-28413
Int. Cl.² C07C *69/02*; B01D *3/10*
U.S. Cl. 203—80 **4 Claims**

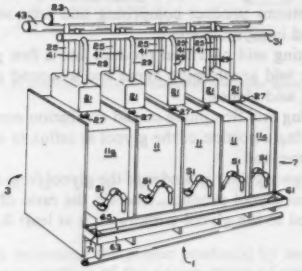


1. A fractional distillation method of separating diacetoxybutent isomers from a reaction mixture, produced from the reaction of butadiene, acetic acid and molecular oxygen which comprises employing a series of two distillation towers, feeding said reaction mixture into the first tower to distill away water and acetic acid under a pressure of 30 – 250 Torr and a tower bottom temperature within the range of from 120° C to less than 190° C, withdrawing the material remaining in the bottom of the first tower and then feeding said material into the second tower to separate diacetoxybutene from high boiling point materials under a pressure of 2 – 100 Torr and a tower bottom temperature within the range of from 120° C to less than 190° C.

4,057,473
METHOD OF REDUCING CELL LIQUOR HEADER CORROSION

Hugh Cunningham, and Carl W. Raetzsch, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 15, 1976, Ser. No. 667,052
Int. Cl.[2] C25B 1/16, 1/26; C23F 13/00
U.S. Cl. 204—98 6 Claims

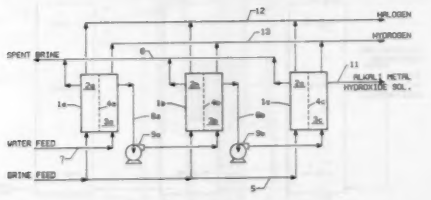


1. In a method of conducting electrolysis comprising feeding alkali metal chloride brine to a plurality of individual electrolytic cells electrically in series, passing electrical current through said cells, recovering electrolyte effluent from each of said individual cells through individual metal outlets, and collecting the electrolyte effluent from a plurality of said cells in a common trough vertically disposed beneath said individual metal outlets, the improvement which comprises maintaining an electrode in contact with the electrolyte effluent in said trough whereby to maintain said trough and said electrolyte anodic with respect to all of said metal outlets.

4,057,474
ELECTROLYTIC PRODUCTION OF ALKALI METAL HYDROXIDE

Bruce E. Kurtz, Marcellus, N.Y.; Joel P. Guptill, Griffith, Ind., and Robert H. Fitch, Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed June 25, 1976, Ser. No. 699,767
Int. Cl.[2] C25B 1/14; C25C 7/00
U.S. Cl. 204—98 15 Claims



1. In a bank of a plurality of cationic permselective membrane cells for electrolysis of aqueous alkali metal halide solution to form alkali metal hydroxide and diatomic halide gas, each cell comprising;

a housing;

an anode and a cathode located within the housing;

a cationic permselective membrane separating the anode and the cathode and dividing the housing into an anode compartment and a cathode compartment;

means for feeding enriched and for withdrawing partially depleted aqueous alkali metal halide solution to and from the anode compartment of each cell in the bank;

means for feeding water or aqueous alkali metal hydroxide solution to the cathode compartment and for withdrawing aqueous alkali metal hydroxide solution from the cathode compartment of each cell in the bank; the improvement which comprises provision of:

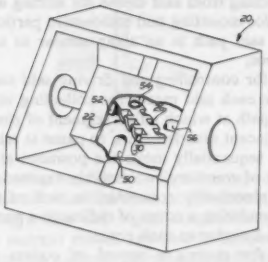
means for transferring catholyte serially from the cathode compartment of one or more preceding cells to the cathode compartment of one or more succeeding cells in the bank.

9. In the process of making aqueous alkali metal hydroxide solution and diatomic halide gas by electrolysis of aqueous alkali metal halide solution in a bank of a plurality of cationic permselective membrane cells, involving feeding enriched and withdrawing partially depleted aqueous alkali metal halide solution to and from the anode compartment of each cell, and feeding water or aqueous alkali metal hydroxide solution to and withdrawing catholyte comprising aqueous alkali metal hydroxide solution from the cathode compartment of each cell, the improvement which comprises transferring catholyte serially from the cathode compartment of one or more preceding cells to the cathode compartment of one or more succeeding cells in the bank.

4,057,475
METHOD OF FORMING A PLURALITY OF ARTICLES

Gustav E. Schrader, Pepper Pike, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed June 28, 1976, Ser. No. 700,542
Int. Cl.[2] C25F 3/00; B23P 1/04, 1/12
U.S. Cl. 204—129.1 28 Claims



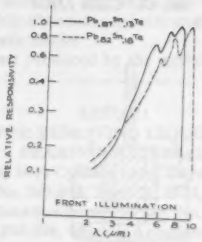
1. A method of at least partially forming a plurality of articles, said method comprising the steps of partially forming a first series of articles in a first longitudinally extending array adjacent to a first edge portion of a workpiece by electrolytically removing material from the workpiece, partially forming a second series of articles in a second longitudinally extending array adjacent to a second edge portion of the workpiece which is opposite from the first edge portion of the workpiece by electrolytically removing material from the workpiece, the first and second longitudinally extending arrays of articles being separated from each other by a longitudinally extending central portion of the workpiece, said steps of partially forming the first and second series of articles including the steps of effecting relative movement between an electrode and the workpiece, establishing a flow of electrolyte between the workpiece and the electrode during the relative movement between the electrode and the workpiece, and establishing an electrical potential between the electrode and the workpiece during the flow of electrolyte between the electrode and the workpiece, said method further comprising the steps of separating the first series of articles from the second series of articles at the longitudinally extending central portion of the workpiece after performing said steps of partially forming the first and second series of articles, and further forming the first and second series of articles after performing said step of separating the first series of articles from the second series of articles, said step of further forming the first and second series of articles includes the step of utilizing the central portion of the workpiece to form a portion of each of the articles.

4,057,476

THIN FILM PHOTOVOLTAIC DIODES AND METHOD FOR MAKING SAME

Esther Krikorian, Claremont, and Michael J. Crisp, Placentia, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed May 26, 1976, Ser. No. 690,344
Int. Cl.[2] C23C 15/00; H01L 31/00
U.S. Cl. 204—192 P 24 Claims



1. An improved method of preparing photovoltaic diodes having thin films $Pb_{1-x}Sn_xTe$, said method comprising:

sputtering from a prereacted $Pb_{1-x}Sn_xTe$ target wherein x is in the range from 0.0 to about 0.3 a single crystal $Pb_{1-x}Sn_xTe$ film of predetermined composition and about 0.1–10μm thickness, wherein x is in the range from 0.0 to about 0.3, on a selected heat resistant single crystal substrate in a reaction zone containing about 0.5–5μm inert gas after first evacuating said reaction zone to at least about 10^{-7} torr, said sputtering being effected at a substrate temperature of about 220°–350° C and at a film growth rate of about 0.1–3.0μm/hr., the particular film deposition conditions being selected and controlled to provide said film with a carrier concentration of predetermined type and value, a Hall mobility of selected value, and a spectral response with cutoff wavelengths ranging from about 0.6μm to about 25μm; and

thereafter depositing on the resulting composite of said film and said single crystal substrate a second film of preselected composition to form a photovoltaic diode.

19. An improved photovoltaic diode, said diode comprising:

a heat resistant monocrystalline substrate,

a first unannealed monocrystalline film of $Pb_{1-x}Sn_xTe$, wherein x is in the range from 0.0 to about 0.3, sputtered on said substrate to form a composite therewith, said first film having selected carrier concentration and Hall mobility and desired carrier type, a spectral response cutoff ranging from about 6μm to about 25μm and

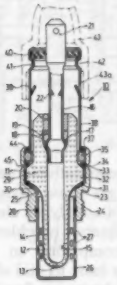
a second film disposed on said composite and selected from the group consisting of a thin, up to about 50A, barrier metal and a crystalline unannealed sputtered film of $Pb_{1-x}Sn_xTe$ wherein x is in the range from 0.0 to about 0.3, wherein the carrier type is opposite that of said first film, wherein said second film has a selected carrier concentration, and Hall mobility and a thickness not in excess of about 5μm.

4,057,477

DEVICE FOR ELECTROCHEMICALLY MEASURING THE CONCENTRATION OF OXYGEN IN COMBUSTION GASES

Helmut Weyl, Schwieberdingen, and Leo Steinke, Hegnach, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 447,330, March 1, 1974, Pat. No. 3,960,693. This application Feb. 3, 1976, Ser. No. 654,918
Claims priority, application Germany, Mar. 28, 1973, 2315444
The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 S 5 Claims

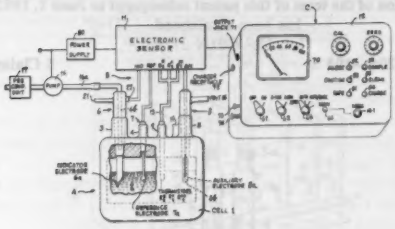


1. A device for electro-chemically measuring the concentration of oxygen in combustion gases, particularly those of internal combustion engines, comprising a housing having a passage which is formed with two spaced open ends with an inner circumferential shoulder intermediate said ends and with a radially inwardly extending rim in the region of one of said open ends; a tubular member of ion-conducting solid electrolyte material having a closed-ended first portion which projects from the other of said open ends, and a second portion which extends through said passage and is formed with an outer circumferential flange of which one axial end face faces towards said other open end and is supported by said shoulder and of which another axial end face faces away from said other open end, the interior of said tubular member being in communication with the ambient atmosphere and the exterior of said first portion being adapted for exposure to a flow of combustion gases, and the materials of said housing and of said tubular member having differential coefficients of thermal expansion and contraction; an electron-conductive inner electrode on an inner surface of said tubular member and being conductively connected with an outside terminal portion; an electron-conductive outer electrode on an outer surface of said tubular member and being conductively connected with said housing; compensating means comprising a discrete annular compensating member installed in said housing separate from but fixed with reference thereto and being confined between said rim and said flange of said tubular member in surrounding engagement with said second portion of said tubular member, said compensating means being of a material having a coefficient of thermal expansion and contraction which compensates for said differential coefficients of said housing and of said tubular member so as to prevent development of cracks or loosening of the seal between said housing and said tubular member; and a body of pulverulent material accommodated in and filling a space defined by said tubular member, housing and annular member, said body being at substantially constant pressure despite the occurrence of differential thermal expansion or contraction due to said differential coefficients.

4,057,478
ELECTROCHEMICAL GAS MONITOR

Stanley Bruckenstein, Williamsville, N.Y., and William G. Sherwood, Arvada, Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 5, 1976, Ser. No. 655,575
Int. Cl.[2] G01N *27/40, 27/52, 27/54*
U.S. Cl. 204—195 P 9 Claims

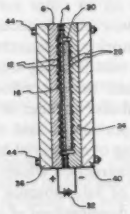


1. An apparatus for quantitatively detecting a selected oxidizable gas present in a gas phase mixture comprising:
means for providing a supply of electrolyte comprising a substantially pure aqueous perchloric acid solution;
a porous electrode comprising an hydrophobic material which is chemically inert to said electrolyte and said gas phase mixture and having a first side comprising gold electrocatalyst means for contacting said electrolyte at an interface and a second side for contacting said gas phase mixture, said electrode allowing at least said selected oxidizable gas present in said gas phase mixture to diffuse from the mixture to said electrocatalyst-electrolyte interface;
means for supplying said gas phase mixture to said second side of said electrode;
means for removing non-selected oxidizable gases which are capable of diffusing to said electrocatalyst-electrolyte interface from said gas phase mixture prior to it being supplied to said second side; and
means electrically connected to said electrode for deriving a signal corresponding to a quantitative measure of the oxidation of the selected oxidizable gas at said interface.

4,057,479
SOLID POLYMER ELECTROLYTE CELL CONSTRUCTION

Barrie C. Campbell, Provo, Utah, assignor to Billings Energy Research Corporation, Provo, Utah

Filed Feb. 26, 1976, Ser. No. 661,789
Int. Cl.[2] C25B *1/02, 9/00*
U.S. Cl. 204—258 8 Claims

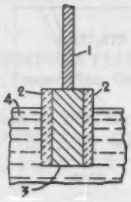


1. A solid polymer electrolyte cell comprising
a solid polymer electrolyte membrane,
an anode disposed on one side of and in contact with said membrane, said anode including a substrate coated with lead dioxide and being formed to enable the flow of fluid between the anode and membrane, with the lead dioxide being maintained in contact with the membrane, and
a cathode formed of a body of sintered material adapted to enable the flow of fluid therethrough and disposed on the other side of and in contact with said membrane.

4,057,480
INCONSUMABLE ELECTRODES

Hanspeter Alder, Flurlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 470,198, May 15, 1975, Pat. No. 3,960,678.
This application Jan. 19, 1976, Ser. No. 649,991
Claims priority, application Switzerland, May 25, 1973, 7522/73
The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.
Int. Cl.[2] C25B *11/04*
U.S. Cl. 204—290 R 17 Claims

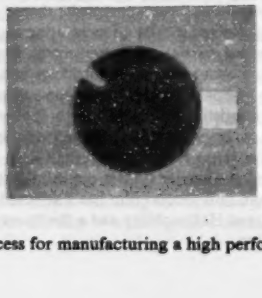


1. In an inconsumable anode comprising an electrode composed of ceramic oxide material, for use in electrolytic recovery of aluminum from a molten charge electrolyte containing aluminum oxide during which electrolytic recovery a predetermined minimum current density is maintained over that portion of the surface of the electrode in contact with the electrolyte to retard the reaction between the electrode and the electrolyte,
the improvement comprising:
a protective ring composed of electrically insulating material which is also resistant against reaction with the electrolyte, said protective ring being disposed on the surface of the electrode at least at the portion of the electrode which during use, normally forms a three phase zone by simultaneous contact with the atmosphere and the electrolyte, whereby said protective ring provides protection to the anode from reaction at the three phase zone.

4,057,481
HIGH PERFORMANCE, QUALITY CONTROLLED BIPOLAR MEMBRANE

Lester T. C. Lee; Gerald J. Dege, both of Parsippany, and Kang-Jen Liu, Somerville, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed May 24, 1976, Ser. No. 689,305
Int. Cl.[2] C25B *13/08*
U.S. Cl. 204—296 16 Claims



1. In a process for manufacturing a high performance, dura-

ble single film bipolar membrane having an ion selectivity above 80% in an electrolyte medium of at least 0.1 molar from a single film wherein an olefinic polymeric film matrix in uniformly impregnated with a mixture of a vinylaromatic monomer and a di- or poly-functional cross-linking agent and said mixture is subsequently polymerized to obtain on the film at least 15 percent by weight of the vinylaromatic mixture based on the total weight of the membrane and said mixture is cross-lined to a degree equivalent to that obtained by a 2 to 20 weight percent of divinylbenzene in styrene, the improvement comprising pre-cleaning the thus prepared cross-linked matrix and thereby removing surface vinylaromatic polymer accumulation, which has not penetrated the matrix surface, from the surface of the cross-linked matrix to render the aromatic nuclei of the impregnated vinylaromatic polymer more readily accessible to functionalization, and thereafter chemically bonding from about 5 to about 98% of the membrane thickness with highly dissociable cationic exchange groups to the aromatic nuclei from one side only, and chemically bonding from about 2 to 50% of highly dissociable anionic exchange groups to the remaining aromatic nuclei.

13. The product produced by the method of claim 1.

4,057,482

APPARATUS FOR REMOVING LIQUID FROM LIQUID BEARING MATERIAL

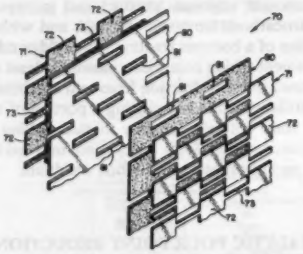
James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

Division of Ser. No. 569,815, April 21, 1975, Pat. No. 3,966,575, which is a continuation-in-part of Ser. No. 499,178, Aug. 21, 1974, Pat. No. 3,893,898, which is a continuation-in-part of Ser. No. 383,255, July 27, 1973, Pat. No. 3,849,275, which is a division of Ser. No. 263,605, June 16, 1972, Pat. No. 3,795,605, which is a continuation-in-part of Ser. No. 53,402, July 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 25,938, April 6, 1970, Pat. No. 3,687,834, which is a continuation-in-part of Ser. No. 864,851, Oct. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 811,421, March 28, 1969, abandoned, and a continuation-in-part of Ser. No. 548,666, Feb. 10, 1975, Pat. No. 3,965,581, which is a continuation-in-part of Ser. No. 469,820, May 14, 1974, Pat. No. 3,931,682, and a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973, and Ser. No. 499,178, Oct. 21, 1974. This application June 21, 1976, Ser. No. 697,873

The portion of the term of this patent subsequent to Aug. 29, 1989, has been disclaimed.

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—299 R **27 Claims**



1. Apparatus comprising passage defining means having inlet means and outlet means with an unobstructed passage therebetween so that relatively wide and continuous strip-like material can be passed through said passage from said inlet means to said outlet means in substantially an unobstructed manner, said apparatus further comprising electrostatic means providing a plurality of non-uniform electrostatic fields each at least partially extending across said passage of said passage defining means intermediate said inlet means and said outlet means and each having its higher intensity portion substantially oppositely located relative to the higher intensity portion of an adjacent non-uniform electrostatic field whereby said non-uniform fields can act on said material as said material is passed through said passage.

4,057,483

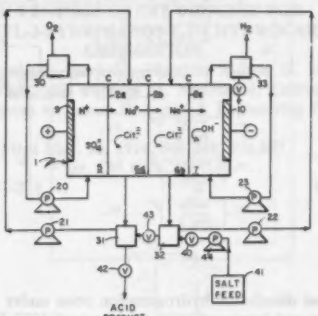
ELECTRODIALYSIS APPARATUS AND PROCESS FOR ION MODIFICATION

Anthony J. Giuffrida, North Andover, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Division of Ser. No. 518,587, Oct. 29, 1974, Pat. No. 3,964,985. This application Apr. 7, 1976, Ser. No. 674,345

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—301 **2 Claims**



1. An electrolytic cell for converting a water soluble salt of an acid into the corresponding acid comprising a container divided into four individual chambers, said cell having at the terminal ends a cathode and anode chamber containing a cathode and anode electrode respectively, first and second intermediate chambers adjacent to each other and placed between said electrode chambers, all four chambers being separated from each other by cation permeable partitions or membranes, said container also having means for separately introducing into, recycling, and removing fluids from each of said chambers from a separate holdup tank associated with each chamber and means for passing a direct current between electrodes transversely through the said chambers;

said cell further comprising means for continuously recycling solutions through each of said four chambers; and

means for passing a solution between the separate holdup tanks associated with each of said intermediate chambers whereby solution from said second intermediate chamber can be processed by said first intermediate chamber.

4,057,484

PROCESS FOR HYDROLIQUEFYING COAL OR LIKE CARBONACEOUS SOLID MATERIALS

John Michael Malek, P.O. Box 2870, Pasadena, Calif. 91105

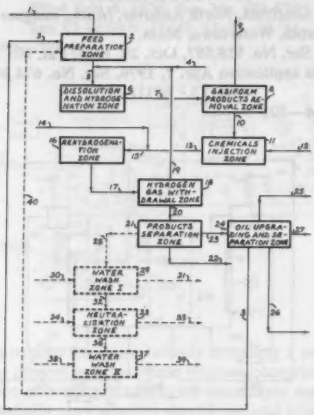
Filed Dec. 15, 1975, Ser. No. 640,946

Int. Cl.[2] C10G *1/00*

U.S. Cl. 208—8 **13 Claims**

1. In a process for producing hydrocarbons by hydroliquefaction of coal, comprising passing the coal feed into a coal dissolution-hydrogenation zone wherein subjecting the coal under an operating pressure in the range of 1000 to 3000 PSIA and an operating temperature in the range of 700° to 900° F to reactions with hydrogen for yielding desired hydrocarbons in a mixture of gasiform and slurryform hydrogenated coal products containing asphaltenes, the improvement consisting in admixing to these slurryform products, after the gasiform part of said mixture of products leaving said coal dissolution-hydrogenation zone has been taken-off, an alkali selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, alkali metal carbonates, ammonium hydroxide, in an amount necessary to break, at least

partly, the acid-base type structures of asphaltenes present in said slurryform products, subjecting the latter to react with the admixed said alkali at an operating temperature in the range of 200° F to 900° F and under an operating pressure up to 3000 PSIA, and subjecting the treated slurryform products to reactions with hydrogen in a rehydrogenation zone different from



said coal dissolution-hydrogenation zone under an operating pressure and temperature in the range of 1050 PSIA to 3100 PSIA and 650° to 900° F respectively, to yield a mixture of a hydrogen containing rehydrogenation product gas with slurryform rehydrogenation products, and separating the hydrogen containing gas product from said slurryform products of the rehydrogenation.

4,057,485

SOLVENT EXTRACTION OF OIL FROM TAR SANDS UTILIZING A CHLORINATED ETHANE SOLVENT

Neil Franklin Blaine, deceased, late of Lomita, Calif., and by Geneva Blaine, executrix, 26007 S. Lucille Ave., Lomita, Calif. 90717

Filed Aug. 23, 1976, Ser. No. 716,872
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE **3 Claims**

1. In an oil solvent extraction process wherein a tar sand is contacted with a solvent at mild conditions of temperatures from 70° F. to about 800° F. and pressures of 0 to about 200 psig, the improvement wherein said solvent is monochloroethane, dichloroethane, trichloroethane or tetrachloroethane.

4,057,486

SEPARATING ORGANIC MATERIAL FROM TAR SANDS OR OIL SHALE

F. Weldon Meadus; Bryan D. Sparks; Ira E. Puddington, and J. Redmond Farnand, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed July 14, 1975, Ser. No. 595,762
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE **18 Claims**

1. A method of agglomerating and separating siliceous solids from hydrocarbons of intimate mixtures thereof, the solids being in finely divided form, and further recovering hydrocarbons, the process comprising:

a. distributing an organic solvent or diluent for the hydrocarbon into a feed mixture comprising siliceous solids and hydrocarbons, in sufficient amounts to dissolve or disperse the hydrocarbons and provide a liquid slurry,

b. providing an aqueous agglomerating liquid for the siliceous solids in the diluted mixture in total amounts of from about 8 to about 50% by wt. of the feed mixture, the amount being selected within said range to enable agglomerates to form of at least about 2 mm. diameter but insufficient to form large soft agglomerates, said aqueous liquid being substantially insoluble in the solvent or diluent and having an affinity for the siliceous solids,

c. agitating the multi-phase diluted mixture severely enough and for a sufficient time to intimately contact the aqueous liquid and the siliceous solids, continuing and controlling the agitation to provide a rolling or tumbling motion until the aqueous liquid and the hydrophilic siliceous solids form into discrete compact agglomerates of at least about 2 mm. diameter,

d. separating the compact agglomerates from the organic phase by screening or by density difference, and

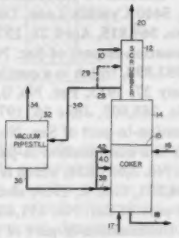
e. recovering said hydrocarbons and solvent or diluent.

4,057,487

FLUID COKING PROCESS

William J. Metrailer, Baton Rouge, La., and Joseph P. Matula, Randolph, N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed July 19, 1976, Ser. No. 706,218
Int. Cl.[2] C10G *9/32*
U.S. Cl. 208—81 **2 Claims**



1. In a process wherein a heavy hydrocarbon oil is cracked to a vaporous product including normally liquid hydrocarbons and to coke in a dense fluidized bed of solid particles in a coking zone maintained under fluid coking conditions which comprises the steps of passing a hot vaporous product from said coking zone to a scrubbing zone, introducing a hydrocarbonaceous oil feed to said scrubbing zone for contacting said oil feed with said vaporous product to condense heavy hydrocarbons from said vaporous product and to vaporize lower boiling hydrocarbons from said oil feed, and withdrawing at least a portion of a bottoms fraction from said scrubbing zone, the improvement which comprises: passing at least a portion of said withdrawn bottoms fraction from said scrubbing zone to a vacuum distillation zone and passing a portion of the vacuum distillation zone bottoms fraction to said coking zone, said hydrocarbonaceous oil feed introduced into said scrubbing zone being an atmospheric distillation residuum.

4,057,488

CATALYTIC POUR POINT REDUCTION OF PETROLEUM HYDROCARBON STOCKS

Angelo Anthony Montagna, Monroeville; Allen Evarts Somers; Stephen Luther Peake, both of Pittsburgh, and Sun Woong Chun, Murrysville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 2, 1976, Ser. No. 738,317
Int. Cl.[2] C10G *23/04*
U.S. Cl. 208—89 **6 Claims**

1. A pour point reduction process which comprises contacting a petroleum hydrocarbon containing greater than 30 ppm nitrogen and greater than 50 percent by volume of material boiling above 450° F. with a denitrogenation catalyst under denitrogenation conditions, said denitrogenation catalyst com-

prising at least one hydrogenation component selected from Group VI-B and Group VIII metals on a refractory oxide carrier, recovering a product hydrocarbon from the denitrogenation zone containing less than 30 ppm nitrogen, contacting said product hydrocarbon with a pour point reduction catalyst under pour point reduction conditions, said pour point reduction catalyst comprising a Group IV-B metal, a Group VIII noble metal, and a decationized mordenite support, said pour point reduction conditions comprising a temperature in the range of 450° to 800° F., a liquid hourly space velocity in the range of 0.2 to 10.0, a hydrogen partial pressure in the range of 500 to 5,000 psig, and a hydrogen circulation rate in the range of 500 to 10,000 standard cubic feet per barrel of feed, and recovering therefrom a petroleum hydrocarbon product of reduced pour point.

4,057,489

PROCESS FOR PRODUCING A TRANSFORMER OIL HAVING LOWER POUR POINT AND IMPROVED OXIDATION STABILITY

Angelo Anthony Montagna; Allen Evarts Somers, and Raynor Tyler Sebulsky, all of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 29, 1976, Ser. No. 755,158
Int. Cl.² C10G *23/02*
U.S. Cl. 208—89 **7 Claims**

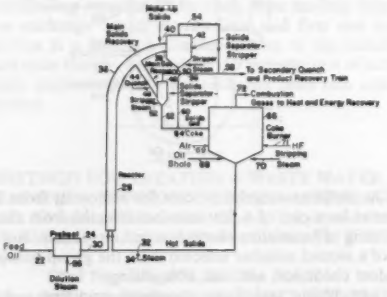
1. A process for producing a transformer oil having a lower pour point and improved oxidation stability which comprises contacting a petroleum lubricating oil feed having a nitrogen concentration of less than 30 ppm and having a Saybolt Universal viscosity at 100° F. in the range of 52 to 62 seconds with hydrogen and a pour point reduction catalyst under pour point reduction reaction conditions, said pour point reduction catalyst comprising a Group IV-B metal, a Group VIII noble metal, and a decationized mordenite support, said pour point reduction reaction conditions providing for a lubricating oil product wherein from 8 to 30 weight percent of said oil feed has been converted to products boiling below 450° F., and subjecting said lubricating oil product having a lower pour point to an oxidation stabilization step to provide said transformeroil.

4,057,490

THERMAL CRACKING PROCESS EMPLOYING CRUSHED OIL SHALE AS FUEL

Francis Edmund Wynne, Jr., Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 12, 1976, Ser. No. 704,464
Int. Cl.² C10G *9/32*
U.S. Cl. 208—127 **6 Claims**



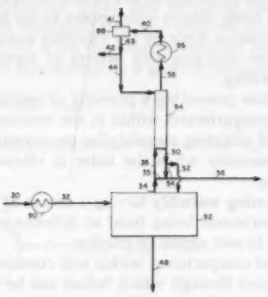
1. In a process for thermal cracking of a hydrocarbon feed oil to produce a product including ethylene, propylene and 1,3-butadiene wherein said feed oil is passed together with entrained hot catalytically inert solids through a cracking zone at a temperature between 1,430° and 2,500° F. for a residence time of 0.05 to 2 seconds and coke-laden hot solids are recovered and passed to a burner zone operated at a temperature above 1,700° F. together with supplementary fuel, the improvement wherein said supplementary fuel comprises crushed oil shale and said entrained hot catalytically inert solids includes solids derived from said shale oil.

4,057,491

SOLVENT RECOVERY PROCESS FOR N-METHYL-2-PYRROLIDONE IN HYDROCARBON EXTRACTION

James D. Bushnell, Berkeley Heights; Milton D. Leighton, Florham Park, and Thomas M. McDonald, Califon, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 26, 1976, Ser. No. 670,887
Int. Cl.² C10G *21/16*
U.S. Cl. 208—321 **8 Claims**



1. An improved process for removing minor amounts of water extraneously introduced into a lube oil extraction solvent comprising NMP and minor amounts of water, said process comprising removing most of said solvent from a lube oil extract, as a first solvent vapor, by flash evaporation, simple distillation, rectification or combination thereof and stripping residual solvent from said extract with a non-aqueous stripping gas to form a mixture of solvent vapor and stripping gas, separating said solvent from said gas and recovering said solvent, wherein the improvement comprises the steps of:

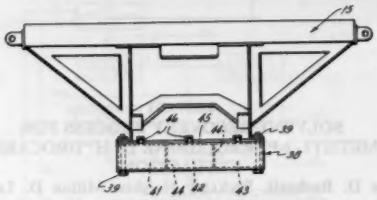
a. combining said first solvent vapor with said mixture;
b. passing said combined mixture which contains extraneous and non-extraneous water through a first condensing zone wherein most of the solvent in said mixture is condensed to a liquid to form a mixture of condensed solvent, stripping gas and vapor and wherein said vapor contains NMP and said extraneous water;
c. passing said second mixture to a separating zone to separate said condensed solvent from said vapor and stripping gas;
d. passing at least a portion of the separated vapor and stripping gas from said separating zone to a rectifying zone wherein said NMP in said vapor is condensed and separated from said extraneous water and stripping gas;
e. passing said extraneous water vapor and stripping gas from said rectifying zone to a second condensing zone to condense the extraneous water and separate same from the stripping gas; and
f. returning a portion of said condensed water from the second condensing zone back to said rectifying zone to act as reflux therein.

4,057,492

ADJUSTMENT OF MOTION OF SCREENING MACHINE

David D. Stasinski, Forest Park, and William E. Lower, Cincinnati, both of Ohio, assignors to Rotex, Inc., Cincinnati, Ohio

Filed June 18, 1976, Ser. No. 697,318
Int. Cl.² B07B 1/44
U.S. Cl. 209—366.5 **11 Claims**



1. In a screening machine including a base, a vibrating assembly resiliently supported by the base, said vibrating assembly including a screen, and drive means for applying an excitation force to said vibrating assembly to move it relative to said base so that the screen is moved in a pattern of screening movement, the screen being tiltable with respect to the base by the action of said excitation force on the vibrating assembly,

means for changing said pattern of screening movement, comprising,

a container presenting a plurality of enclosed separate hollow compartments within it, the container being secured to said vibrating assembly for movement with the vibrating assembly when the latter is vibrated by the drive means,

the vibrating assembly having a center of gravity, the said compartments being fixed at different positions with respect to said center of gravity,

each said compartment within said container having a closable port through which ballast can be selectively introduced into the respective compartment,

the addition of such ballast into the compartment changing the relative position of the center of gravity of said vibrating assembly with respect to said excitation force, and thereby changing the pattern of screening movement by changing the tilting effect of said excitation force on said vibrating assembly.

4,057,493

DROPLET CONTROL ELEMENTS

Graham Arthur Davies, 19 Downesway, Alderley Edge, Cheshire; Godfrey Vaughan Jeffreys, 8 Heaton Drive, Four Oaks Park, Sutton Coldfield, Warwickshire, and David Pryce Bayley, Clements House, Station Approach, South Croydon, Surrey, all of England

Continuation of Ser. No. 327,838, Jan. 30, 1973, abandoned. This application Mar. 8, 1976, Ser. No. 665,076
Int. Cl.² B01D 17/04
U.S. Cl. 210—23 R **10 Claims**

1. A method of treating a liquid-liquid dispersion comprising droplets of a first liquid phase dispersed in a second liquid phase so as to promote coalescence of said droplets of said first liquid phase, which method comprises:

flowing said dispersion through a perforate packing comprising a coalescer body having an entry face, an exit face and a labyrinth of interstitial passages for said dispersion extending between said entry and exit faces, said body comprising high and low surface energy materials formed into threads, fibers or filaments, said high surface energy material being a metal, metal oxide, metal salt, glass or ceramic, and said low surface energy material being a solid organic polymeric material, said first liquid phase wetting one of said materials but not the other and said second liquid phase wetting said other material but not the said one material, said high and low surface energy materials meeting one another throughout said body at a plurality of surface junctions to provide enhanced droplet coalescence properties for said droplets of said first liquid phase, and said surface junctions occurring at said entry and exit faces and being substantially uniformly dispersed throughout said interstitial passages of said body exposed to said dispersion, whereby said body presents to said dispersion an array of surface junctions disposed along the path of flow of said dispersion at which said droplets coalesce, and

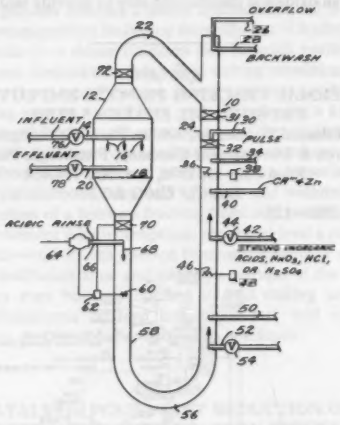
removing coalesced droplets of said first liquid phase from the exit face of said coalescer body.

4,057,494

REMOVAL OF CHROMIUM, CHROMATE, MOLYBDATE AND ZINC

Randhir C. Chopra, Knoxville, Tenn., assignor to Chemical Separations Corporation, Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 488,630, July 15, 1974, Pat. No. 3,972,810. This application July 14, 1976, Ser. No. 705,171
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.
Int. Cl.² B01D 15/02; C02B 1/42, 1/56
U.S. Cl. 210—33 **16 Claims**



1. A continuous cyclic process for removing from influent water at least one of a first member selected from the group consisting of hexavalent chromium and molybdate, and at least one of a second member selected from the group consisting of trivalent chromium and zinc comprising:

1. introducing said water containing said first and second members entrained therein into the upper portion of a first section of an ion exchange vessel having a shiftable ion exchange resin bed therein and causing said water to flow downwardly through said ion exchange resin bed consisting essentially of a mixture of weak base anion exchange resin and weak acid cation exchange resin in hydrogen ion

form, wherein each type resin is present in said mixture in an amount of at least 20% by volume of the total volume of said resin mixture and wherein said weak acid cation exchange resin is present in an amount sufficient to supply sufficient hydrogen ions so that said first member is transferred from said water to said weak base anion exchange resin even when said influent water is not acidic, whereby said first and second members are transferred, respectively, to said weak base anion exchange resin and to said weak acid cation exchange resin;

2. withdrawing from the lower portion of said first section the resulting water with substantially reduced amounts of said first and second members;
3. introducing a first regenerating agent into one portion of a second portion of said ion exchange vessel containing said mixture of weak base anion exchange resin loaded with said first member and weak acid cation exchange resin loaded with said second member, from (1) and causing said first regenerating agent to contact said ion exchange resin mixture;
4. withdrawing from said one portion of said second section said first regenerating agent containing one of said first and second members,
5. essentially simultaneous with the introduction of said first regenerating agent in (3) introducing a second regenerating agent into another portion of said second section of said ion exchange vessel containing said mixture of weak base anion exchange resin and weak acid cation exchange resin previously treated in (3) and causing said second regenerating agent to contact said ion exchange resin mixture;
6. withdrawing from said another portion of said second section said second regenerating agent containing the other of said first and second members;
7. transferring ion exchange resin regenerated at (5) in said second section and introducing the same into the lower portion of said first section for contact with water containing said first and second members, thereby displacing ion exchange resin loaded with said first and second members from the upper portion of said first section;
8. transferring said ion exchange resin loaded with said first and second members and displaced from the upper portion of said first section to another section of said ion exchange vessel communicating therewith, thereby displacing another portion of said ion exchange resin loaded with said first and second members from said another section;
9. transferring said another portion of said ion exchange resin loaded with said first and second members and displaced from said another section to said one portion of said second section for regeneration therein;
10. detecting the presence of contaminants in the ion exchange resin bed being transferred between the said second section and said first section and in response thereto introducing aqueous acidic resin rinse medium into said ion exchange vessel intermediate said first and second section in a direction counter-current to the transfer of said resin thereby establishing the introduction of substantially contaminant-free ion exchange resin into said first section.

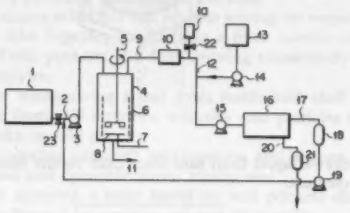
4,057,495

METHOD FOR TREATING A WASTE WATER CONTAINING A NONIONIC SURFACE ACTIVE AGENT

Mototaka Kinoshita, Chiba; Akio Okabe, Tokyo, and Susumu Ando, Chiba, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Japan

Filed Sept. 17, 1976, Ser. No. 724,254
Claims priority, application Japan, Sept. 17, 1975, 50-112417
Int. Cl.² B01D *21/01*
U.S. Cl. 210—44 **5 Claims**

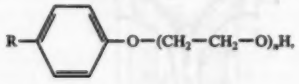
1. A method for recovering a nonionic surface active agent from a nonionic surface active agent containing waste water to purify the waste water, which consists of separating by a foam separation step a low concentration waste water with less than 500 ppm of a nonionic surface active agent into a concentrated water containing more than 500 ppm of nonionic surface active agent and a treated water containing less than 3 ppm of nonionic surface active agent; adding an inorganic electrolyte selected from the group consisting of Na_2SO_4, K_2SO_4, $Al_2(SO_4)_3$, $Fe_2(SO_4)_3$, NaCl, KCl, $CaCl_2$, $MgCl_2$, $FeCl_2$, $FeCl_3$ and $AlCl_3$ to the concentrated water to insure a concentration of electrolyte in the concentrated water of more than 50 ppm, heating the resultant concentrated water containing electrolyte



to 100° to 200° C under a pressure of 2 to 5 kg/cm² to separate it into a high concentration nonionic surface active agent solution and a separated water, and recycling the separated water to the foam separation step, said nonionic surface active agent being selected from the group consisting of polyoxyethylenealkylether represented by a general formula:

$$RO—(CH_2—CH_2—O)_nH,$$

polyoxyethylenealkylphenylether represented by a general formula:



and fatty ester of polyethyleneglycol represented by a general formula:

$$R—COO—(CH_2—CH_2—O)_nH,$$

where R denotes C_6 to C_{24} alkyl radical or alkenyl radical and n denotes 2 to 40.

4,057,496

METHOD AND DEVICE FOR FILTRATION

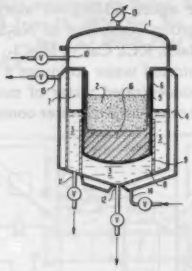
Sadayoshi Itagaki, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed June 15, 1976, Ser. No. 696,330
Claims priority, application Japan, June 17, 1975, 50-73364
Int. Cl.² B01D *37/00, 23/04*
U.S. Cl. 210—65 **10 Claims**

1. A method of filtering slurries to obtain a filtrate and a sedimented filter cake, comprising,

a. supplying a slurry to a bag-shaped filter medium within a filter tank,
b. forcing the liquid from said slurry to enter a bottom filter chamber and a side filter chamber, separated from one another by a baffle extending slightly higher than the expected height of the sedimented filter cake on the bottom of said bag-shaped filter medium, to leave a sedimentation of filter cake on the bottom and side walls of said bag-shaped filter medium,
c. said bottom and side filter chambers having exit ports for the removal of filtrate therefrom, and (d) subsequent to the forcing of the liquid, applying a pressure differential on opposite sides of said bag-shaped filter medium while simultaneously having closed all exit ports of said side

filter chamber and having the exit port of said bottom filter chamber open, whereby said pressure differential



draws liquid from said filter cake on the bottom of said medium.

4,057,497

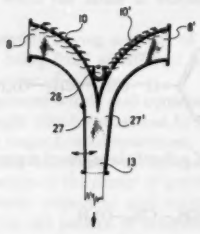
METHOD AND APPARATUS FOR DISPENSING MULTI-COMPONENT LIQUID SUSPENSIONS

Michal Skrabak; Ernest Vavrik; Stanislav Kolarik, and Milos Mazak, all of Bratislava, Czechoslovakia, assignors to Slovenska vysoka skola technicka, Bratislava, Czechoslovakia

Continuation-in-part of Ser. No. 499,789, Aug. 22, 1974, abandoned. This application Nov. 5, 1975, Ser. No. 628,884

Int. Cl.[2] B01D *21/00, 37/00*

U.S. Cl. 210—65 **2 Claims**



1. A process for dispersing multi-component liquid suspensions, comprising passing at least two liquid suspension streams through adjacent nozzles at different velocities to form a mixed stream in a main outlet nozzle wherein the difference in velocity of the suspension streams, issuing from the adjacent nozzles is sufficient to cause a whirling and oscillating turbulence movement for dispersing the suspension streams, and lensifying the suspension before entering the main outlet nozzle, by centrifugal forces, acting on the outer perforated walls of a curved nozzle whereby a densified suspension is formed and withdrawing a filtrate through a take-off duct disposed at the end portion of the perforated walls.

4,057,498

CONCENTRATORS FOR RECOVERING LIQUID POLLUTANT FLOATING ON THE SURFACE OF A SHEET OF WATER

Jacques Vidilles, 24, Bd Maillot, 92200 Neuilly, France

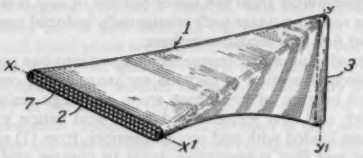
Filed Mar. 3, 1976, Ser. No. 663,540

Claims priority, application France, Mar. 6, 1975, 75.07031

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—170 **11 Claims**

1. A concentrator for the recovery of a water-immiscible liquid pollutant floating on the surface of a sheet of water, which comprises a duct of flexible material having an inlet orifice with a larger and a smaller dimension along mutually perpendicular axes for locating with its larger dimension substantially parallel to the surface of the sheet of water, the shape of the duct varying across its length such that at its end remote from the inlet orifice it has a section with a larger and a smaller dimension along mutually perpendicular axes, its larger dimension being in a plane substantially perpendicular to the surface of the sheet of water when the larger dimension of the inlet orifice is parallel to the surface of the sheet of water, a flexible grid connected across the inlet orifice so as to maintain a fixed



geometry of said inlet orifice, at least one outlet orifice for the outflow of the liquid pollutant from the concentrator, a tubular coupling connected to the outlet orifice for the liquid pollutant for recovery of the pollutant therefrom by pumping, an upper transverse float extending the length of the inlet orifice, and at least one float extending the length of the duct, the cross-sectional area of said duct being substantially constant between the inlet and outlet orifices.

4,057,499

APPARATUS FOR SEPARATION OF BLOOD

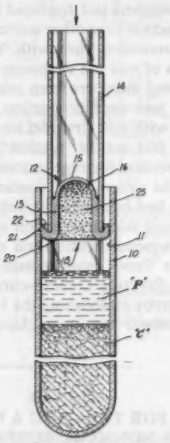
Frank S. Buono, Garfield, N.J., assignor to Becton, Dickinson & Company, East Rutherford, N.J.

Filed Mar. 9, 1973, Ser. No. 339,867

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 24, 1976

Int. Cl. B01d *33/00*

U.S. Cl. 210—136 **13 Claims**



1. A piston assembly for use in separating the liquid phase from the cellular phase of a blood sample in a blood collection tube of the type which is closed at one end and open at the other end which comprises:

a central body member provided with a portion which permits the passage of the liquid phase and with a peripheral projecting flexible flange of greater diameter than the internal diameter of the collection tube and having a smooth lower surface and a radially grooved upper surface so that when the piston assembly is shifted inwardly

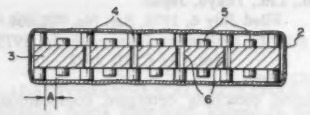
into the collection tube the lower surface of the flange has sealing wiping engagement with the inner wall of the tube and the liquid phase will be forced through the central body portion to be isolated on the other side of the piston assembly and so that when the piston assembly is shifted outwardly the upper grooved surface of the flange engages the inner wall of the tube whereby air can bypass through the grooves to the inner portion of the collection tube.

4,057,500

EARTH DRAIN

Oleg Wager, Bromma, Sweden, assignor to Burcan International Limited, Dublin, Ireland

Filed July 2, 1976, Ser. No. 702,040
Claims priority, application Canada, July 25, 1975, 232232
Int. Cl.² B01D *29/04*; E02B *11/00*
U.S. Cl. 210—170 **8 Claims**



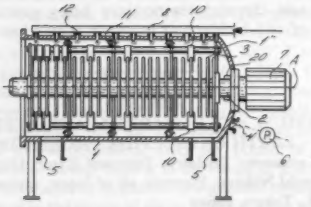
1. An earth drain comprising a core consisting of an elongated web having on at least one surface thereof a first array of discrete, longitudinally and transversely spaced projections of uniform height, and a second array of discrete, longitudinally and transversely spaced projections of a height less than the projections of said first array, the projections of said second array being interspersed amongst projections of said first array, and a filter of sheet-like water permeable material encasing said at least one surface, said projections in said second array being spaced from the adjacent projections in said first array for blocking the approach of the central area of said filter among a group of projections in said first array which surround said central area toward said core under high soil pressure conditions and keeping the spaces between adjacent projections of said first and second arrays free for liquid pressure communication therethrough.

4,057,501

FILTER APPARATUS AND FILTER ELEMENT THEREFOR

Hans Müller, Im Allmendli, 8703 Erlenbach, Switzerland

Filed June 9, 1976, Ser. No. 694,196
Claims priority, application Switzerland, June 17, 1975, 7963/75; July 11, 1975, 9208/75
Int. Cl.² B01D *33/28*
U.S. Cl. 210—331 **14 Claims**



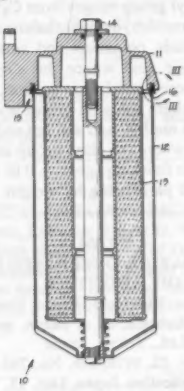
1. A filtering apparatus comprising:
a cylindrical housing having a horizontal central axis and defining a closed chamber;
means for introducing a liquid carrying particles into said chamber;
a hollow elongated shaft in said chamber;
a plurality of laterally extending arms on said shaft provided with rollers riding on the inside of said housing;
a plurality of generally square and rigid filter supports fixed and spaced longitudinally on said shaft with same passing generally centrally through said supports;
a respective pocket of filter cloth completely and snugly surrounding each of said filter supports, each pocket being formed of a pair of juxtaposed and coextensive generally square filter-cloth panels having three sides permanently joined together and a fourth open side, said shaft passing generally centrally through said pockets;
openable means at each of said pockets joining the respective fourth sides together for forming a filter interior inside each of said pockets, said shaft opening transversely into said interiors;
means for withdrawing liquid from inside said shaft and thereby from said interiors, whereby said particles form filter cake on said panels;
means for rotating said shaft, said supports, said pockets, said arms, and said openable means jointly; and
means for spraying a rinse liquid on said pockets during rotation thereof for washing off said filter cake.

4,057,502

SEAL FOR CARTRIDGE-TYPE FILTER ASSEMBLIES

Albert W. Crumrine, Peoria, and Lawrence F. Fratzke, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1976, Ser. No. 680,824
Int. Cl.² C02C *1/14*
U.S. Cl. 210—440 **17 Claims**



1. A filter assembly having an inlet and an outlet comprising
a base having an annular recess defined therein, said recess being generally U-shaped in cross section and defined by a bottom wall and a pair of sidewalls,
a filter mounted on said base and disposed within the confines of said recess,
a substantially impervious case having an open end mounted at said recess on said base, said filter disposed within said case, and
annular sealing means disposed within said recess, between said base and the open end of said case, for automatically centering the open end of said case therein and for applying substantially equal sealing pressures against the bottom and sidewalls defining said recess.

11. A composite annular sealing means disposed in a horizontally disposed plane and adapted for use in filter assemblies and the like comprising;
an annular metallic insert having a generally U-shaped cross section throughout the entire circumferential length thereof and defining an annular top wall disposed in parallel relationship relative to said plane and a pair of radially

spaced sidewalls disposed at different radial distances from a center of said insert and connected to said top wall and disposed in at least generally perpendicular relationship relative to said plane,

an annular elastomeric member, molded as an integral part of said insert, comprising an outer sealing portion disposed exteriorly on said top and sidewalls to define three contiguous sealing surfaces and a plurality of circumferentially disposed slots formed through at least one of the sidewalls of said insert and said elastomeric member.

4,057,503

CONCENTRATES FOR IMPARTING TEMPORARY SOIL RELEASE RESINS IN FABRICS DURING LAUNDERING

Clair Warren Graver, King of Prussia; Clarence Edward Carwheel, Philadelphia, and Charles Joseph Bunczk, Norristown, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 20, 1975, Ser. No. 623,700
Int. Cl.² D06M *13/20*
U.S. Cl. 252—8.7 **6 Claims**

1. An acidic aqueous concentrate for dispersion in water for use as the final treatment of a laundering process at a pH of about 4 to about 6.5 to impart temporary soil and stain release properties to fabrics consisting essentially of: acrylic resin — 3 to 10 parts, laundry sour — 3 to 10 parts, coupling and dispersing agent selected from the group consisting of alkyl aryl sulfonates where the alkyl group ranges from C_3 to C_{12} and the aryl group is benzene, naphthalene and diphenyl, alkyl sulfonates where the alkyl group ranges from C_{10} to C_{12}; alkyl sulfates where the alkyl group ranges from C_8 to C_{12}; acids and salts of condensed formaldehyde-naphthalene sulfonates where the salts may be sodium, potassium and ammonium; salts of sulfonated alkylsuccinic acid where the alkyl group ranges from C_4 to C_8 and where the salts are sodium, ammonium and potassium; taurates where the acyl group is oleoyl and coco and the alkyl group is methyl; and sodium and potassium salts of alkylether sulfates where the alkyl group may be C_{12} or C_{13} — 0.5 to 3 parts; fabric finishing agent — 0 to 1 part and water — 93.5 to 76 parts, all parts being by weight.

4,057,504

METHOD OF PREPARING OVERBASED LUBRICATING OIL ADDITIVES

Michio Shiga, Fujisawa; Kimitoshi Hirano, Kawasaki, and Matsuo Matsushita, Yokohama, all of Japan, assignors to Kaconite Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,860
Claims priority, application Japan, Dec. 15, 1975, 50-149275
Int. Cl.² C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 **17 Claims**

1. A method for preparing an overbased lubricating oil additive, which comprises the steps of:

I. forming a mixture consisting essentially of (1) an oil-soluble organic acid, or a metal salt thereof, wherein said organic acid is selected from the group consisting of hydrocarbon carboxylic acids and hydrocarbon sulfonic acids wherein the hydrocarbon group has from 8 to 150 carbon atoms, and (2) a compound selected from the group consisting of alkaline earth metal oxides and alkaline earth metal hydroxides, in a lubricating oil as a reaction medium, the metal ratio being in the range of from 2 to 15,

II. adding to said mixture an accelerator composition consisting essentially of

(a) from 0.5 to 1.2 moles of a dihydric alcohol having from 2 to 6 carbon atoms, per one mole of component (2) in said mixture,

(b) from 0.01 to 0.2 moles of an alkyl phenol having from about 4 to 100 carbon atoms in the alkyl groups, per one mole of component (2) in said mixture, and

(c) from 0.1 to 0.6 gram atoms of elemental sulfur, per one mole of component (2) in said mixture,

heating the mixture to a temperature above 120° C and effective to cause the reaction in the liquid phase, until the water formed by the reaction is distilled off; and then

III. blowing carbon dioxide gas into the reaction mixture obtained in step II, at a temperature above 100° C, to transform at least part of the excess of alkaline earth metal into the corresponding carbonate, and distilling off the volatile substances from the reaction product to obtain the overbased lubricating oil additive.

14. An overbased lubricating oil additive prepared by the method of claim 1.

4,057,505

LIQUID CLEANING AND BLEACHING COMPOSITION

Yunosuke Nakagawa, Koshigaya; Kanji Majima, and Sigeyuki Miyamoto, both of Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed July 6, 1976, Ser. No. 702,404
Claims priority, application Japan, July 14, 1975, 50-85961
Int. Cl.² C11D *9/42*
U.S. Cl. 252—96 **11 Claims**

1. A liquid bleaching detergent composition, consisting essentially of an aqueous solution of:

from 3 to 7 weight percent of sodium, lithium or potassium hypochlorite;

from 0.5 to 8 weight percent of surfactant having the formula

$$R_1—\underset{\displaystyle CH_2OSO_3M}{\overset{\displaystyle |}{CH}}—R_2$$

wherein R_1 and R_2 are alkyls having from one to 13 carbon atoms, with the proviso that the total number of carbon atoms of R_1 plus R_2 is from 8 to 14, and M is Li, Na or K;

and the balance is essentially water.

4,057,506

HEAVY-DUTY LIQUID DETERGENT

Steven Lang Sung, Edison, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Filed Dec. 30, 1975, Ser. No. 645,152
Int. Cl.² C11D *3/06, 11/00*
U.S. Cl. 252—135 **7 Claims**

1. In a process for preparing a stable, aqueous, heavy duty liquid detergent containing by weight from about 5% to about 50% water soluble anionic detergent and from about 5% to about 50% builder salt in water, the improvement wherein the builder salt in water is heated at an elevated temperature above about 60° in the presence of a stabilizing amount of fatty acid amide emulsifying agent and thereafter cooling the mixture to below about 40° C, the amount of builder salt dissolved in said water at said elevated temperature being greater than the solubility of said builder salt in water at said lower temperature.

4,057,507

EUROPIUM AND SAMARIUM ACTIVATED RARE EARTH OXYSULFIDE PHOSPHOR

Hajime Yamamoto, Kodaira; Tsuyoshi Kano, Higashiyamato, and Masaki Nakano, Hamura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 18, 1975, Ser. No. 642,008
Claims priority, application Japan, Dec. 20, 1974, 49-145572
Int. Cl.² C09K *11/46*
U.S. Cl. 252—301.4 S **6 Claims**

1. A rare earth oxysulfide phosphor consisting essentially of a compound of the general formula,

$$(Y_u\ Gd_{1-u})_{1-x-y-z}Eu_xSm_y(Tb_{1-p}\ Pr_p)_z\cdot O_2S$$

wherein $0 \leqq z \leqq 1\times10^{-4}$, $0 \leqq p \leqq 1$, $0 \leqq u \leqq 1$, and x and y satisfy the area B of FIG. 5 defined by *a*, *b*, *c* and *d*.

4,057,508

X-RAY PHOSPHORS WITH LOW AFTERGLOW

Robert Wade Wolfe, Wysox, and Russell Francis Messier, Furnace, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 1, 1976, Ser. No. 746,414
Int. Cl.² C09K *11/46*
U.S. Cl. 252—301.4 H **6 Claims**

1. An x-ray luminescent composition consisting essentially of an activated host represented by the formula:

$$Ba_{1-x}Sr_xFCl{:}yEu.aY.bLi$$

wherein x is from 0 to about 0.3 y is from about 0.002 to about 0.2 a is from about 0.001 to about 0.1 b is from 0 to about 0.1, having a smaller afterglow than an X-ray luminescent composition consisting essentially of

$$Ba_{1-x}Sr_xFCl{:}yEu.$$

4,057,509

POLYGALACTOMANNAN ALLYL ETHER GELS

John R. Costanza, North Plainfield; Ronald N. DeMartino, Wayne, both of N.J., and Arthur M. Goldstein, Plainview, N.Y., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,668
Int. Cl.² B01J *13/00*
U.S. Cl. 252—316 **6 Claims**

1. A gel composition consisting essentially of water, between about 0.05 and 2 weight percent sulfur dioxide, and between about 0.25 and 5 weight percent polygalactomannan allyl ether gum having a degree of substitution between about 0.01 and 3.0.

5. A process for preparing a gel of polygalactomannan allyl ether gum which comprises introducing sulfur dioxide into an aqueous solution of between about 0.25 and 5 weight percent polygalactomannan allyl ether gum having a degree of substitution between about 0.01 and 3.0 in sufficient quantity to increase the viscosity of the aqueous solution to gel formation.

4,057,510

PRODUCTION OF NITROGEN RICH GAS MIXTURES

William B. Crouch, Whittier; Carolina P. Fabiero, Roland Heights, and Allen M. Robin, Anaheim, all of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,601
Int. Cl.² C01B *2/00, 2/14*
U.S. Cl. 252—372 **9 Claims**

1. In the partial oxidation of a hydrocarbonaceous feedstock selected from the group consisting of hydrocarbonaceous fuel, liquid oxygenated hydrocarbonaceous material, and mixtures thereof with air and optionally in the presence of a supplemental temperature moderator in the reaction zone of a free-flow, noncatalytic, unpacked, refractory lined gas generator at a pressure in the range of about 1 to 250 atmospheres and a temperature in the range of about 1300° to 3000° F to produce an effluent gas mixture comprising H_2, CO, H_2O, CO_2, H_2S, COS, N_2 and A, the improvement comprising: reacting said hydrocarbonaceous feedstock containing no metals nor noncombustible materials with air and supplemental H_2O in the range of nil to 1.0 pounds of H_2O per pound of fuel, and wherein the O/C atomic ratio is in the range of 2 to 3.8 when said hydrocarbonaceous feedstock is a gaseous hydrocarbonaceous fuel, and in the range of about 2 to 2.8 when said hydrocarbonaceous feedstock is a liquid hydrocarbonaceous fuel or liquid oxygenated hydrocarbonaceous material; producing an effluent gas mixture substantially comprising N_2, A, and CO_2, and containing at least one gas from the group H_2, CO, H_2O, COS and H_2S, and being free-from particulate carbon, free-oxygen and nitrogen oxides; and removing at least one gas from the group CO_2, H_2O, COS, H_2S, H_2, and CO in a gas drying and purification zone to produce a nitrogen-rich gas mixture.

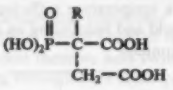
4,057,511

PROCESS FOR PREVENTING CORROSION AND THE FORMATION OF SCALE IN WATER CIRCULATING SYSTEM

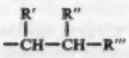
Gerhard Bohnsack, Bergisch-Neukirchen; Hans Geffers; Herbert Kallfass, both of Cologne, and Walter Radt, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 362,449, May 21, 1973, Pat. No. 3,933,427.
This application Nov. 6, 1975, Ser. No. 629,724
Claims priority, application Germany, May 26, 1972, 2225645
Int. Cl.² C23F *11/10, 11/16*
U.S. Cl. 252—389 A **3 Claims**

1. A composition for preventing corrosion and the formation of scale in water-conducting systems which comprises by weight 1 to 20% of a Zn salt, 5 to 30% by weight of H_3PO_4, and the balance of a compound of the formula



wherein R is hydrogen, alkyl, alkenyl, or alkinyl having up to 4 carbon atoms; phenyl; cycloalkyl having 3 to 6 carbon atoms; benzyl; phenethyl or



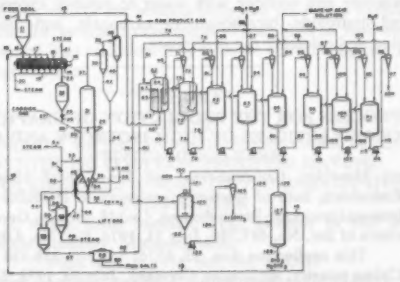
wherein R′ is hydrogen, alkyl having 1 to 4 carbon atoms or carboxyl, R″ is hydrogen or methyl and R‴ is carboxyl or a water soluble salt thereof.

4,057,512

ALKALI METAL CATALYST RECOVERY SYSTEM

Charles J. Vadovic, LaPorte; Robert D. Wesselhoft, and Nicholas C. Nahas, both of Baytown, all of Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Sept. 29, 1975, Ser. No. 618,292
Int. Cl.² C01D *5/02, 13/00*; C01F *7/34*; C01B *33/12*
U.S. Cl. 252—413 **16 Claims**



1. A process for the recovery of alkali metal catalyst residues from a mixture of solid particles containing said alkali metal catalyst residues, carbonaceous solids, and ash particles including iron, aluminum and silicon compounds, said mixture being produced by the gasification of carbonaceous solids in the presence of an alkali metal catalyst, which comprises magnetically removing iron constituents from said mixture of solid particles to produce solids of reduced iron content; treating said solids of reduced iron content with an acid solution in

which said alkali metal catalyst residues are soluble and recovering a spent acid solution containing soluble alkali metal compounds, soluble aluminum salts, and soluble silicon compounds; raising the pH of said spent acid solution sufficiently to precipitate said soluble aluminum compounds contained in the spent acid solution as aluminum hydroxide, and thereafter separately recovering said aluminum hydroxide and a solution containing said soluble alkali metal compounds and said soluble silicon compounds.

3. A process as defined by claim 1 wherein said solids of reduced iron content are treated with said acid solution in a multistage countercurrent liquid-solids extraction system.

9. A process as defined by claim 1 including the additional step of separating high carbon content particles having a density less than that of said spent acid solution from low carbon content particles of higher density following the magnetic removal of said iron constituents from said mixture of solid particles.

10. A process as defined by claim 1 including the additional step of heating said solution containing said soluble alkali metal compounds and said soluble silicon compounds, following the precipitation of said soluble aluminum compounds as aluminum hydroxide, to a temperature sufficient to precipitate silicon as orthosilicic acid and recovering an alkali metal solution of reduced silicon content.

4,057,513
HYDROGENATION CATALYST AND PROCESS FOR PREPARING SAME

Wolfgang Biedermann, and Horst Köller, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 23, 1976, Ser. No. 651,994

Claims priority, application Germany, Feb. 14, 1975, 2506348

Int. Cl.² B01J *29/10, 29/20, 29/00*

U.S. Cl. 252—459 **15 Claims**

1. Catalyst comprising cobalt manganese and copper in the form of their oxides, an alkali metal oxide and silicon dioxide, the weight ratio of cobalt to manganese being 25:1 to 1:1, the copper content being 0.01 to 2 percent by weight based on the total weight of catalyst, the amounts of metals in each case being calculated as metals.

7. Process for preparing a catalyst which comprises adding an excess of an aqueous solution of a hydroxide, bicarbonate or carbonate of an alkali metal to an aqueous solution of water-soluble cobalt salts, manganese-(II) salts and copper salts to form a precipitate, adding an aqueous solution of an alkali metal silicate or SiO_2 sol to the precipitate, filtering off the precipitate and washing with water to remove excess alkali metal hydroxide, bicarbonate or carbonate, and thereafter drying and calcining the precipitate.

4,057,514
PROCESS FOR THE PRODUCTION OF GRAPHITE MOLDED ARTICLES OF HIGH ISOTROPY AND HIGH HEAT CONDUCTIVITY

Hans Huschka, Grossauheim, and Franz-Josef Herrmann, Rodenbach, both of Germany, assignors to HOBEG Hochtemperaturreaktor-Brennelement, GmbH, Hanau, Germany

Division of Ser. No. 487,786, July 11, 1974, Pat. No. 4,013,760. This application Aug. 13, 1976, Ser. No. 714,328

Claims priority, application Germany, July 30, 1973, 2338562

Int. Cl.² H01B *1/04*

U.S. Cl. 252—510 **12 Claims**

1. A process of preparing an article containing isotropic pyrolytic carbon particles of high heat conductivity as a filler comprising pyrolyzing a hydrocarbon gas on isotropic carbon granulates to form a deposit of isotropic pyrolytic carbon on the isotropic carbon granulates having a particle size above 100μm, then grinding to form an isotropic carbon powder having a particle size below 100μm and an average particle size larger than 5μm, mixing a binder with the powder filler and then molding an article therefrom.

4,057,515
PERFUME COMPOSITIONS

Harmannus Boelens, Huizen; Jan Theodor Marie Francois Maessen, Naarden, and Leendert Maarten van der Linde, Huizen, all of Netherlands, assignors to N.V. Chemische Fabriek "Naarden", Naarden, Netherlands

Continuation of Ser. No. 8,729, Feb. 4, 1970, abandoned. This application Apr. 17, 1975, Ser. No. 569,317

Claims priority, application Netherlands, Feb. 4, 1969, 6901750

Int. Cl.² A61K *7/46;* **C07C** *45/00*

U.S. Cl. 252—522 **3 Claims**

1. A perfume composition comprising conventional perfume constituents and an effective amount of 4-(tricyclodecylidene)-butanal-1 to impart a fruity-green, muguet-like note.

2. A perfume composition comprising conventional perfume constituents and an effective amount of 4-(tricyclodecenylidene)-butanal-1 to impart a fruity-green, muguet-like note.

3. A perfume composition conprising conventional perfume constitutents and an effective amount of 4-(decalinylidene-2')-butanal-1 to impart a fruity-green, muguet-like note.

4,057,516
PREPARING PERFUMED COMPOSITIONS CONTAINING 8-ALLYL-8-HYDROXYTRICYCLO[5,2.1.0^{2,6}]DECANE ALONE OR COMBINED WITH O-HYDROXYBENZYL ETHYL ETHER

Harmannus Boelens, Huizen, and Hendrik Jacob Wobben, Naarden, both of Netherlands, assignors to Naarden International, N.V., Naarden-Bussum, Netherlands

Filed Nov. 25, 1975, Ser. No. 635,213

Claims priority, application Netherlands, Nov. 27, 1974, 7415485

Int. Cl.² C11B *9/00*

U.S. Cl. 252—522 **4 Claims**

1. A process for the production of perfume compositions comprising adding to perfume components usual for this purpose at least one compound reminiscent of castoreum selected from the group consisting of 8-allyl-8-hydroxytricyclo (5,2,1,0^{2,6}) decane in a quantity of at least 100 ppm of the composition and mixtures of o-hydroxybenzyl ethyl ether and 8-allyl-8-hydroxytricyclo (5,2,1,0,^{2,6}).

4,057,517
SYNTHETIC RESIN FUNGICIDAL PAINT COMPRISING 1,3-DITHIOLO-(4,5-B)PYRAZIN-2-YLIDENE-PROPANEDINITRILE 4-OXIDE

Craig E. Mixan; Christian T. Goralski, and R. Garth Pews, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 649,175, Jan. 15, 1976. This application Nov. 10, 1976, Ser. No. 740,632

Int. Cl.² C08L *91/00*

U.S. Cl. 260—22 R **2 Claims**

1. A fungicidal paint comprising a substantially water-insoluble synthetic resinous binder selected from the group consisting of acrylates, alkyd-modified acrylates, polyvinyl acetate-acrylate copolymer, alkyds and oil-modified alkyds in combination with from about 0.25 to about 5 weight percent of 1,3-dithiolo (4,5-b) pyrazine-2-ylidene-propanedinitrile 4-oxide.

4,057,518

PROCESS FOR THE MANUFACTURE OF HEAT RESISTANT MULTICELLULAR MATERIALS

René Angleraud, Feyzin, and Pierre Ledru, Lyon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 17, 1975, Ser. No. 569,316

Claims priority, application France, Apr. 19, 1974, 74.13693; Nov. 13, 1974, 74.37431

Int. Cl.[2] C08J *9/18, 9/22*

U.S. Cl. 260—2.5 N 7 Claims

1. Process for the manufacture of a multicellular material which comprises preparing pre-expanded granules of:

1. a prepolymer which is a product of reaction of N,N'-4,4'-diphenylmethane-bis-maleimide and 4,4'-diaminodiphenylmethane, the ratio

$$\frac{\text{number of double bonds in the bis-maleimide}}{\text{number of } -NH_2 \text{ groups in the diamine}}$$

being from about 1 to about 5;

2. a flowing agent; and

3. a cell-control agent;

the degree of expansion of which is a maximum of 90%, placing these granules in a mould and effecting complete expansion and thermo-setting of the polymer by heating.

4,057,519

SODIUM SILICATE EXTENDED POLYURETHANE FOAM

John E. Summers, McMurray, and John F. Hadley, Bradford Woods, both of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 503,288, Sept. 5, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 641,077

Int. Cl.[2] C08G *18/38, 18/14*

U.S. Cl. 260—2.5 AK 5 Claims

1. A process for producing a rigid foam structure having a density of 1.5 to 4.5 pounds per cubic foot and a K-factor less than 0.26 which comprises reacting together as a foam forming formulation

A. a hydroxyl-terminated polyester having a viscosity greater than 100,000 cps at 25° C;

B. an organic polyisocyanate prepolymer or quasi-prepolymer prepared by reacting at least one polyol with an excess of organic polyisocyanate;

C. aqueous sodium silicate having a weight ratio of SiO_2/Na_2O of 2.4 to 3.0 and an aqueous content of 25 to 75 percent by weight;

wherein at least one of the three components (A, B, C) contains a dissolved halogenated alkane blowing agent;

in the presence of a surfactant and a catalyst for the reaction of —OH and —N=C=O radicals; and

wherein the weight of said aqueous alkali metal silicate constitutes from 30 to 60 percent of the components.

2. A homogeneous polyurethane foam, essentially free of uncombined water, formed by the process of claim 1.

3. The process of claim 1 wherein the said foam forming formulation includes 0.5 to 5.0 percent by weight of an organic condensable resin selected from the class consisting of melamine-formaldehyde, urea-formaldehyde and methylolated melamine-formaldehyde; and also includes a catalyst for the condensation of melamine resins.

4,057,520

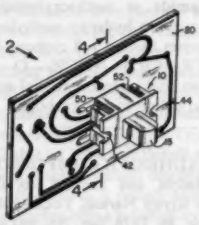
SLIDE SWITCH ASSEMBLY HAVING FLEXIBLE HOUSING WITH MOVABLE CONTACTS MOUNTED ON PRINTED CIRCUIT BOARD

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.

Filed Oct. 5, 1976, Ser. No. 729,780

Int. Cl.[2] H01H *15/04, 9/02*

U.S. Cl. 200—16 D 4 Claims



1. A switching device for selectively connecting a first contact point on a printed circuit board or the like, with at least one other contact point thereon, said switching device being adapted for mounting through slots in the printed circuit board and comprising:

at least one electrically conductive slide contact member;

a housing having side members extending below the body thereof such that said side members may be inserted through respective slots in the printed circuit board, and having at least one cavity formed therein for mounting said slide contact member so that when said side members are inserted through said slots, a segment of said slide contact member contacts the surface of the printed circuit board, and with the length of said segment of the slide contact member and the spacing and position of said contact points being such that said first contact point may be selectively connected to at least one other contact point by the movement of said side members along said slots; and

said side members each including an outwardly protruding lateral lip formed along the end thereof remote from the main portion of the housing and wherein the spacing between the side members relative to that of said slots in such that when the side members are projected through the slots the lips engage the underside of the printed circuit board contiguous to the outer edges of the slots, and said side members each being defined by spaced slots in the side wall of the housing body and are sloped outward from the vertical to the edges of said slots so that when inserted into said slots they provide pressure against the edges thereof.

4,057,521

ABSORBENT ARTICLES MADE FROM CARBOXYLIC SYNTHETIC POLYELECTROLYTES HAVING COPOLYMERIZED N-SUBSTITUTED ACRYLAMIDE CROSSLINKER

James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1974, Ser. No. 494,439

Disclosure was also published under second Trial Voluntary Protest Program on April 13, 1976 as document No. B 494439.

Int. Cl.[2] C08F *220/34*

U.S. Cl. 260—29.6 HN 6 Claims

1. A solution useful to form water swellable articles of a carboxylic synthetic polyelectrolyte upon curing which comprises

1. a solvent selected from the group consisting of water, lower alcohols and mixtures thereof,

2. about 5 to about 60 percent by weight based on (1) of a

crosslinkable carboxylic copolymer which contains in the copolymer

A. about 25 to about 98 percent by weight based on the total weight of the copolymer of units derived from an alkali metal salt of an olefinically unsaturated monosulfonic or monocarboxylic acid;

B. about 2 to about 50 percent by weight of an olefinically unsaturated monocarboxylic acid; and

C. about 0.1 to about 5.0 percent by weight of an N-substituted acrylamide or methacrylamide wherein the substituent group is a hydroxy methylene or an alkoxymethylene group having 1–8 carbons having the formula $H_2C=CR—C(O)—NHCH_2—O—R'$ wherein R is selected from hydrogen or methyl and R' is hydrogen or an alkyl group of 1–8 carbons.

4,057,522

LIQUID ADHESIVE COMPOSITION

Kiyoji Naruse, Yokkaichi, and Tadashi Ito, Ibaraki, both of Japan, assignors to Kiyoji Naruse, Yokkaichi, Japan

Filed Feb. 26, 1976, Ser. No. 661,824

Claims priority, application Japan, Feb. 27, 1975, 50-24305; Feb. 27, 1975, 50-24304

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28.5 AS **7 Claims**

1. A liquid adhesive composition in the form of an aqueous emulsion, which is prepared by kneading a mixture of (a) a substantially atactic polypropylene having an average molecular weight of approximately 3,000 to approximately 30,000, (b) 0.03 to 0.5 part by weight, based on 1 part by weight of said polypropylene, of a polyvinyl alcohol having a saponification degree of at least 70% and (c) approximately 0.05 to 2.0 parts by weight of water based on 1 part by weight of the polyvinyl alcohol, and then, dispersing the kneaded mixture in water.

4,057,523

STABLE, AGED, COATING COMPOSITION

Werner Josef Blank, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 130,524, April 1, 1971, abandoned. This application Jan. 18, 1973, Ser. No. 324,687

Int. Cl.² C08L *61/20*

U.S. Cl. 260—29.4 UA **7 Claims**

1. A stable, aged composition suitable for depositing a coating by electrophoresis comprising: an aqueous dispersion of a mixture of from about 2% to about 60%, by weight, of (A) a polymeric, water insoluble, substantially fully etherified polymethylol melamine or guanamine, said polymeric material having at least 70% of its molecular weight above about 1,000 and at least 40% of its molecular weight above about 3,000 by weight, and correspondingly from about 98% to about 40% of (B) a water dispersible non-gelled polymeric material carrying an ionic charge which polymeric material contains at least one class of reactive groups selected from the group consisting of carboxyl groups, alcoholic hydroxy groups and amide groups wherein the amount of said groups is at least about 3%, by weight, and not more than about 30%, by weight, based on the total weight of said polymeric material; wherein said groups are heat reactive with (A) and wherein said percentages of (A) and (B), by weight, total 100% and are based on the total solids weight of (A) and (B).

4,057,524

EPOXY DERIVATIVE COMPOSITIONS

William R. Menyhert, Rte. 1 Box 97, Easton, Md. 21601

Continuation-in-part of Ser. No. 456,238, March 29, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,720

Int. Cl.² C08L *33/02*

U.S. Cl. 260—29.2 EP **32 Claims**

1. The process for stabilizing the velocity of the primary reaction of an epoxide having at least one oxirane group in an aqueous system which comprises:

passing said epoxide into a reaction zone including an aqueous liquid and carbon dioxide for generating resonance of the oxirane oxygen of said epoxide when it contacts said carbon dioxide,

contacting said epoxide with said carbon dioxide to stabilize said epoxide by equalizing the reactivity rates of the alpha and beta carbon atoms of said oxirane group in the subsequent primary reaction of said epoxide in aqueous phase, and

passing said stabilized epoxide into said aqueous liquid.

4,057,525

METHODS FOR PREPARING STABLE SILICA SOLS AND INORGANIC COATING COMPOSITIONS

Kiyoshi Kikuchi, Hiratsuka; Takeo Okano, Zama; Yukio Terakawa, and Akira Nishihara, both of Tokyo, all of Japan, assignors to Kowa Chemical Industry Ltd., Japan

Filed Mar. 15, 1976, Ser. No. 667,141

Claims priority, application Japan, Mar. 20, 1975, 50-33879; Nov. 11, 1975, 50-135294

Int. Cl.² C08L *61/28*

U.S. Cl. 260—29.4 R **15 Claims**

2. An inorganic coating composition consisting essentially of a stable silica sol, as binder, which is prepared by adding at least one dihydric long chain alcohol having at least 3 carbon atoms, a small amount of a water-soluble melamine resin and an acrylic resin emulsion, to a silica sol having a silica content of about 30% by weight; a mixture of pigment, aggregate and filler in a quantity corresponding to a weight ratio of said silica sol to said mixture of 1 : 2–20; usual additives for coating material in a suitable quantity; and water.

4,057,526

PROCESS FOR PREPARING FROST RESISTANT CONCRETE

Poppe de Rook, Monnickendam, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed May 6, 1976, Ser. No. 683,958

Claims priority, application Netherlands, May 12, 1975, 7505525

Int. Cl.² C04B *7/35*

U.S. Cl. 260—29.6 S **12 Claims**

1. In a process for the preparation of a frost resistant concrete, in which process a volume percentage of gas in a finely divided form is incorporated in a fresh concrete mixture which is subsequently allowed to cure, the improvement which comprises adding the gas to the mixture while it is entrapped in spheres of a synthetic polymer which is inert under the curing conditions, the dimensions of the spheres being in the range of about 10 to 100 μm and the amount in which they are added in the range of 0.01 to 0.1% by weight, calculated on the dry cement weight.

4,057,527

AQUEOUS ACRYLATE CONTACT ADHESIVE DISPERSIONS

Peter Spiros Columbus, Whitestone, N.Y., assignor to Borden, Inc., Columbus, Ohio

Continuation of Ser. No. 475,222, June 17, 1974, abandoned. This application May 14, 1976, Ser. No. 686,469

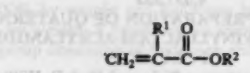
Int. Cl.² C08L *33/02*

U.S. Cl. 260—29.6 WB **8 Claims**

1. An aqueous contact adhesive dispersion composition having pH of 3 to 10 which, on drying at room temperature, remains tacky to itself but otherwise becomes non-tacky, comprising, on 100 parts by weight basis, 25 to 75 parts of water having dispersed therein:

A. 25 to 70 parts of a water insoluble binder polymer with a Tg between about −20° C and +15° C which is a reaction product of (a), (b), (c) and (d), as defined below:

a. 50 to 99% by weight of the polymer, of an acrylate monomer or a mixture thereof having the following structural formula:



wherein R^1 is selected from H and a lower alkyl group of 1 to 4 carbon atoms and R^2 is selected from alkyl groups of 1 to 8 carbon atoms;

b. 0.1 to 10% by weight of the polymer, of N-methylol acrylamide or N-methylol methacrylamide;

c. 0.1 to 25% by weight of the polymer, of acrylic acid or methacrylic acid;

d. 2 to 40% by weight of the polymer, of acrylonitrile or methacrylonitrile;

B. an effective amount and up to 3 parts by weight of the composition, of an alkali metal or ammonium salt of a polyacrylic acid to thicken the composition; and

C. an effective amount but not exceeding about 3 parts by weight of the composition, of a surface active agent to impart freeze-thaw stability to the composition.

4,057,528

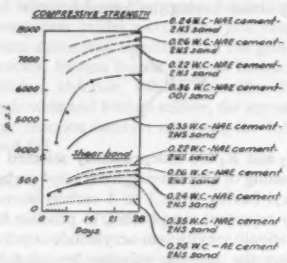
PROCESS FOR REPAIRING CONCRETE STRUCTURES USING PNEUMATICALLY SPRAYABLE CEMENT MORTAR COMPOSITIONS CONTAINING PORTLAND CEMENT, MINERAL AGGREGATE, A STYRENE-BUTADIENE COPOLYMER LATEX AND WATER

David A. Hunt, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 19, 1976, Ser. No. 678,280

Int. Cl.² C08L *9/10*

U.S. Cl. 260—29.7 S **8 Claims**



1. In the process of repairing concrete structures by applying a cement mortar thereto the improvement consisting of pneumatically applying to the concrete structure to be repaired, a mixture of a substantially non-air entraining portland cement, mineral aggregate, a styrene-butadiene copolymer latex having a styrene to butadiene weight ratio of from about 30:70 to about 70:30, said copolymer being present on a solids basis in an amount of from about 5 to about 25 percent by weight of cement, and from about 0.1 to 5 percent of a polyorganosiloxane foam depressant based on the weight of active polyorganosiloxane, while maintaining the ratio of total water to cement in such mixture at a value of from 0.22 to 0.26.

4,057,529

RUBBER COMPOSITIONS HAVING IMPROVED ADHESION AFTER THERMAL AGING

Thomas J. Leo, Yardley, Pa.; Thomas N. Loser, Princeton, N.J., and Michael J. Reynolds, Morrisville, Pa., assignors to Wyrough and Loser, Inc., Trenton, N.J.

Filed Feb. 27, 1976, Ser. No. 662,050

Int. Cl.² C08K *3/20, 5/09;* C09K *15/04, 15/32*

U.S. Cl. 260—42.47 **38 Claims**

1. A rubber composition comprising a highly unsaturated rubber, a magnesium compound capable of donating electrons and a carboxylated cobalt oxy metal complex comprising at least one metal atom selected from Groups IIIA, IIIB, IVA, IVB, VA and VB of the Periodic Table, at least one cobalt atom, said metal and cobalt atoms being linked through oxygen atoms, at least one acyloxy radical attached to a cobalt atom, and any residual valences of said complex being satisfied by acyloxy, aryloxy or alkoxy radicals, said magnesium compound and ssid cobalt complex being used in small amounts which are sufficient for obtaining a high level of adhesion between the rubber and a metal surface and improving the retention of such adhesion after thermal aging.

13. A method for improving the retention of adhesion after thermal aging of a rubber composition to a metal surface comprising compounding a highly unsaturated rubber with a magnesium compound capable of donating electrons, and a carboxylated cobalt oxy metal complex comprising at least one metal atom selected from Groups IIIA, IIIB, IVA, IVB, VA and VB of the Periodic Table, at least one cobalt atom, said metal and cobalt atoms being linked through oxygen atoms, at least one acyloxy radical attached to a cobalt atom, and any residual valences of said complex being satisfied by acyloxy, aryloxy or alkoxy radicals, said magnesium compound and said cobalt complex being used in small amounts which are sufficient for obtaining a high level of adhesion between the rubber and the metal surface and improving the retention of such adhesion after thermal aging,

and contacting the rubber composition with the metal surface.

27. A composition comprising a magnesium compound capable of donating electrons and a carboxylated cobalt oxy metal complex comprising at least one metal atom selected from Groups IIIA, IIIB, IVA, IVB, VA and VB of the Periodic Table, at least one cobalt atom, said metal and cobalt atoms being linked through oxygen atoms, at least on acyloxy radical attached to a cobalt atom, and any residual valences of said complex being satisfied by acyloxy, aryloxy or alkoxy radicals, said magnesium compound and said cobalt complex being used in small amounts which are sufficient for obtaining a high level of adhesion between a highly unsaturated rubber and a metal surface and improving the retention of such adhesion after the thermal aging when the composition is used in the rubber.

4,057,530

2-PHENYL-INDOLE DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Charles Pigerol, Saint-Ouen; Paul de Cointet de Fillain, Sisteron; Souli Nanthavong, Grenoble, and Jacques Le Blay, Luisant, all of France, assignors to Labaz, Paris, France

Filed June 2, 1975, Ser. No. 582,915

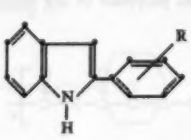
Claims priority, application France, June 18, 1974, 74.21042

Int. Cl.² C07D *209/04, 209/14, 209/18;* C08K *5/34*

U.S. Cl. 260—45.8 N **9 Claims**

1. New stabilizers of polyvinyl chloride and co-polymers of vinyl chloride, the said stabilizers being 2-phenyl-indole derivatives corresponding to the following general formula:

I



wherein R represents a phenyl group, an amino group, optionally substituted by an acetyl or benzoyl group, a mercapto group, optionally substituted by a branched- or straight-chain alkyl group containing from 1 to 12 carbon atoms or by a cyclohexyl radical, a carboxyl radical, a group R_1O—, wherein R_1 represents an atom of hydrogen, an isopropyl, carboxymethyl, carbethoxymethyl, carbethoxyisopropyl, acetyl, docosanoyl, benzoyl, benzyl, or allyl radical or a branched- or

straight-chain alkyl radical containing from 6 to 12 carbon atoms.

4,057,531

FIRE RETARDANT POLYSTYRENE

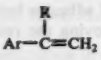
Michael Dubeck, Birmingham, and David R. Brackenridge, Royal Oak, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 363,789, May 25, 1973, which is a continuation-in-part of Ser. No. 70,922, Sept. 9, 1970, abandoned. This application Jan. 31, 1977, Ser. No. 764,044

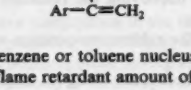
Int. Cl.² C08K *5/05*

U.S. Cl. 260—45.95 R **3 Claims**

1. A flame retardant polystyrene composition comprising (i) a solid polymer of



wherein Ar is a benzene or toluene nucleus, and R is —H or —CH_3; and (ii) a flame retardant amount of a compound having the formula



4,057,532

SELF-EXTINGUISHING, NON-DRIPPING, PHENOLPHTHALEIN POLYESTER MOLDING COMPOSITIONS

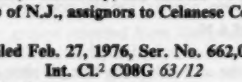
Lowell Saferstein, Piscataway, and Robert W. Stackman, Morristown, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,055

Int. Cl.² C08G *63/12*

U.S. Cl. 260—47 C **10 Claims**

1. A flame retardant polyester of the recurring structural formula



wherein D is a divalent radical remaining after removal of hydroxyl groups from a diol mixture comprising from about 25 to about 60 mole percent of phenolphthalein and correspondingly about 75 to about 40 mole percent of ethylene glycol; and R is a divalent radical remaining after the removal of carboxyl groups from a dicarboxylic acid selected from the group consisting of isophthalic acid, terephthalic acid, and mixtures thereof, and n equals at least 10.

4,057,533

PROCESS FOR PREPARATION OF QUATERNIZED CATIONIC VINYLLACTAM-ACRYLAMIDE COPOLYMERS

Eugene V. Hort, Piscataway, N.J., and Earl P. Williams, Pen Argyl, Pa., assignors to GAF Corporation, New York, N.Y.

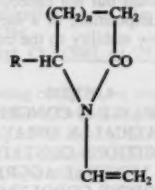
Continuation-in-part of Ser. No. 268,840, July 3, 1972, abandoned, and a continuation-in-part of Ser. No. 27,171, April 9, 1970, abandoned. This application Oct. 29, 1975, Ser. No. 627,017

Int. Cl.² C08F *8/32, 8/34*

U.S. Cl. 260—67.5 **8 Claims**

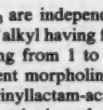
1. The process which comprises the steps sequentially in combination:

A. copolymerizing between about 30 and 95 percent by weight of a N-vinyllactam having the formula:



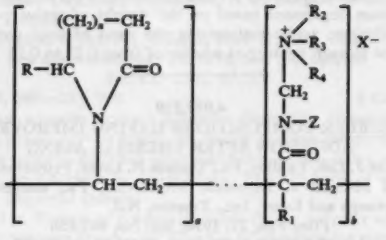
wherein R is hydrogen, methyl or ethyl and *n* is an integer of 1 to 3, with between about 5 and about 70 percent by weight of acrylamide or methacrylamide in a nonacidic aqueous solution in the presence of a free radical catalyst at a temperature of between about 25° and about 150° C.;

B. reacting the resulting copolymer with formaldehyde and a secondary amine having the formula:



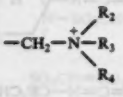
wherein R_2 and R_3 are independently selected from the group consisting of alkyl having from 1 to 4 carbon atoms, hydroxyalkyl having from 1 to 4 carbon atoms and together may represent morpholine, to produce the corresponding cationic vinyllactam-acrylamide copolymer; and

C. quaternizing the cationic polymer by reacting with a compound selected from the group consisting of a benzyl halide, an alkyl halide having from 1 to 6 carbon atoms, an alkyl sulfate having from 1 to 6 carbon atoms, an alkyl ester of sulfonic acid having from 1 to 6 carbon atoms and mixtures thereof to produce a quaternized copolymer having a K value less than 200 consisting essentially of the following recurring units in primarily random distribution:



wherein R, R_2, R_3 and *n* are as defined above; R_1 is selected from the group consisting of hydrogen and methyl; R_4 is selected from the group consisting of alkyl having 1 to 6 carbon atoms and benzyl radicals in an amount of 10

to 100% by weight and hydrogen in an amount of 0 to 90% by weight; X represents an anion; Z is selected from the group consisting of hydrogen and



wherein R_2, R_3, and R_4 are as defined above; *a* represents from 30 to 95 percent by weight of the lactam moiety in the copolymeric product; *b* represents from 5 to 70 percent by weight of the acrylamide moiety in said copolymeric product.

4,057,534

METHOD FOR PREVENTING SCALE FORMATION IN A CONTINUOUS ESTER-INTERCHANGE REACTION FOR PRODUCTION OF POLYESTERS

Tadashi Konishi, and Masashi Kuno, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 19, 1976, Ser. No. 678,390
Claims priority, application Japan, Apr. 23, 1975, 50-48570
Int. Cl.² C08G *63/14, 63/16*
U.S. Cl. 260—75 R **8 Claims**

1. A method for preventing scale formation in a continuous ester-interchange reaction for the production of polyesters, which comprises subjecting a dialkyl ester of a difunctional carboxylic acid at least 80 mol% of which consists of terephthalic acid and at least one glycol to a continuous ester-interchange reaction in the presence of a catalytic amount of an ester-interchange reaction catalyst composed of a manganese compound selected from the group consisting of manganese halides, manganese oxides and organic acid salts of manganese and a lithium compound selected from the group consisting of lithium acetate, lithium borate, lithium bromide, lithium carbonate, lithium chloride, lithium fluoride, lithium hydride, lithium hydroxide and lithium sulfate, the amount of said ester-interchange reaction catalyst satisfying the following expressions (i) and (ii)

(i) $0.015 < X + Y < 0.2$

(ii) $0.2 \leq Y/(X + Y) \leq 0.7$

wherein X is the amount in moles of said manganese compound based on said dialkyl ester, and Y is the amount in moles of said lithium compound based on said dialkyl ester.

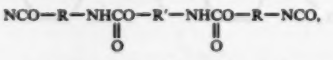
4,057,535

ADHESIVE FOR GLUING TOGETHER SOFT BODY TISSUES

Tatyana Esperovna Lipatova, ulitsa Vladimirskaya, 51/53, kv. 22; Roman Alexandrovich Veselovsky, Kharkovskoe shosse, 21/3, kv. 179, and Georgy Alexandrovich Pkhakadze, ulitsa Nikolskobotanicheskaya, 3, kv. 8, all of Kiev, U.S.S.R.

Filed Apr. 14, 1976, Ser. No. 676,989
Int. Cl.² C08G *18/32*; A61K *31/74*; A61L *17/00*; C08G *18/18*
U.S. Cl. 260—77.5 AC **6 Claims**

1. An adhesive for gluing together soft body tissues, which has the following composition, wt.%:
aromatic diisocyanate, from 1 to 50
macrodiisocyanate of the general formula



where
R is an aromatic diisocyanate radical
R′ is a polyether or polyester radical, from 98.9 to 30
2,4,6-tris(dimethylaminomethyl)phenol, from 0.1 to 20.

4,057,536

PROCESS FOR PREPARING WHOLLY AROMATIC POLYAMIDES BY MIXING SOLID PARTICULATE REACTANTS AND POLYMERIZING

Rufus S. Jones, Jr., Randolph, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 14, 1976, Ser. No. 648,986
Int. Cl.² C08G *69/32*
U.S. Cl. 260—78 R **11 Claims**

1. A process for the preparation of a wholly aromatic polyamide from an aromatic diamine and an aromatic diacid halide comprising:

a. mixing solid particulate diamine and solid particulate aromatic diacid halide in the substantial absence of oxygen and in the absence of a solvent or diluent therefor to obtain a uniform stoichiometrically balanced solids mixture; and

b. thereafter polymerizing the resulting uniform solids mixture in an amide solvent to obtain said wholly aromatic polyamide having an inherent viscosity of at least above about 0.7 to about 6.0, said inherent viscosity being measured on a solution of 0.4 grams of polyamide per 100 cc. of concentrated H_2SO_4 at 25° C.

4,057,537

COPOLYMERS OF L-(−)-LACTIDE AND EPSILON CAPROLACTONE

Richard G. Sinclair, Columbus, Ohio, assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1975, Ser. No. 544,788
The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.
Int. Cl.² C08G *63/08*
U.S. Cl. 260—78.3 R **6 Claims**

1. A non-gummy, high impact, non-brittle, thermally stable copolymer of an optically active lactide and epsilon caprolactone, said copolymer being obtained by heating a mixture of L-(−)-lactide having a melting point below 100° C. and epsilon caprolactone at a temperature above the melting point of L-(−)-lactide and below 200° C. in the presence of a catalyst, said mixture comprising about 75 to about 90 percent by weight of L-(−)-lactide.

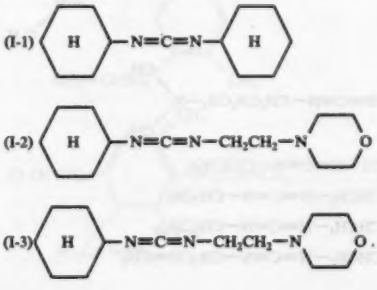
4,057,538

METHOD FOR HARDENING GELATIN

Teiji Habu; Tsuneo Wada; Takashi Sasaki; Shigemasa Itoh; Takayoshi Ohmura; Hiroki Ishii, and Hisashi Yamaguchi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1975, Ser. No. 549,329
Claims priority, application Japan, Feb. 13, 1974, 49-17942
Int. Cl.² C09H *7/00*
U.S. Cl. 260—117 **6 Claims**

1. A method for hardening gelatin, which comprises treating said gelatin with a combination of a compound selected from the group consisting of:



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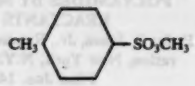
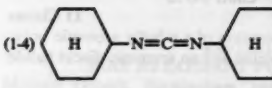
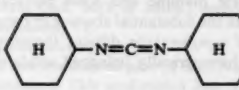
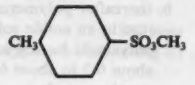




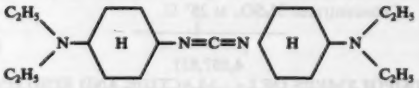
(I-4)



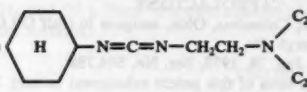
(I-5)



(I-6)

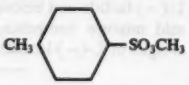


(I-7)



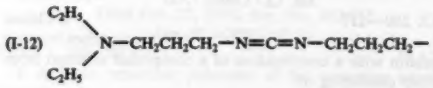
(I-8) $C_2H_5-N=C=N-CH_2CH_2-N$ O

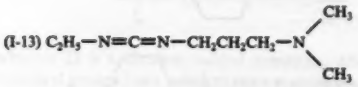
(I-9) $C_2H_5-N=C=N-CH_2CH_2-N$ O .



(I-10) $C_2H_5-N=C=N-CH_2CH_2-N$ O . HCl

(I-11) $C_2H_5-N=C=N-CH_2CH_2-N$ O . $\frac{1}{2}H_2SO_4$





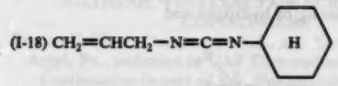
(I-14) $(CH_3)_2CH-N=C=N-CH(CH_3)_2$

(I-15) $CH_2=CHCH_2-N=C=N-CH_2CH_3$

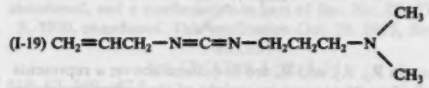
(I-16) $CH_2=CHCH_2-N=C=N-CH(CH_3)_2$

(I-17) $CH_2=CHCH_2-N=C=N-CH_2CH=CH_2$

-continued



(I-18)



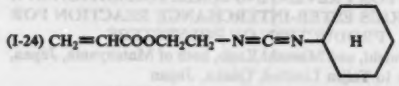
(I-19)

(I-20) $CH_3OCH_2CH_2CH_2-N=C=N-CH_2CH_3$

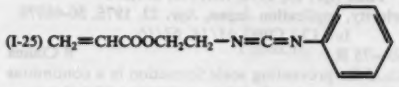
(I-21) $CH_3OCH_2CH_2CH_2-N=C=N-CH_2CH_2SCH_2CH_3$

(I-22) $CH_2=CHCOOCH_2CH_2-N=C=N-C_2H_5$

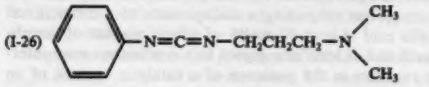
(I-23) $CH_2=CHCOOCH_2CH_2-N=C=N-CH_2CH=CH_2$



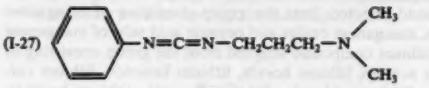
(I-24)



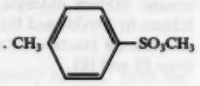
(I-25)



(I-26)

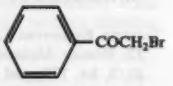


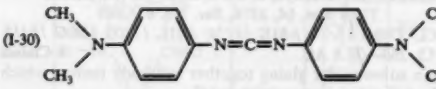
(I-27)



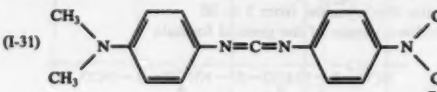
(I-28)

(I-29)





(I-30)



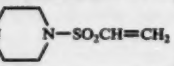
(I-31)

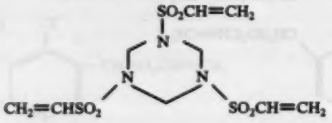
and a compound selected from the group consisting of:

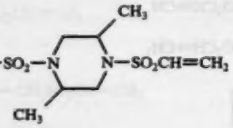
(II-1) $CH_2=CHSO_2CH_2CH_2SO_2CH=CH_2$

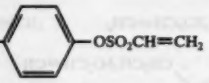
(II-2) $CH_2=CHSO_2CH_2CH_2CH_2CH_2CH_2SO_2CH=CH_2$

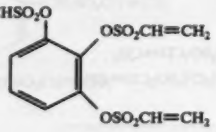
-continued

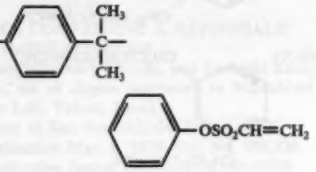
(II-3) 

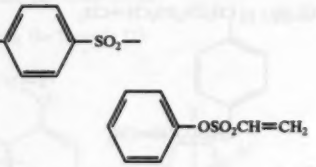
(II-4) 

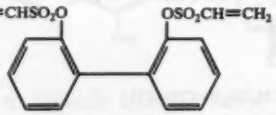
(II-5) 

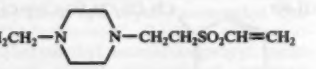
(II-6) 

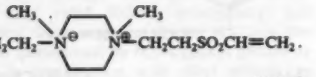
(II-7) 

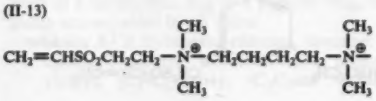
(II-8) 

(II-9) 

(II-10) 

(II-11) 

(II-12) 

(II-13) 

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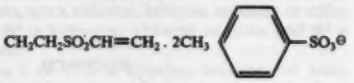
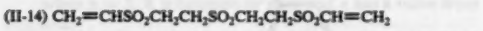
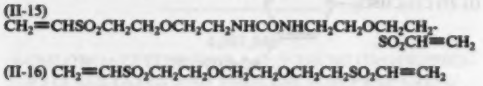
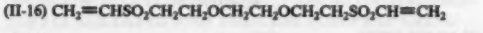
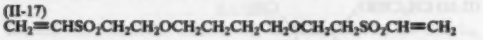
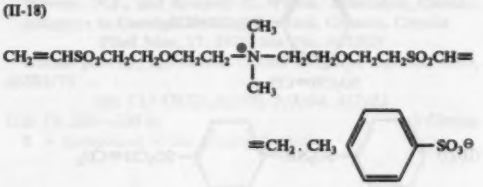


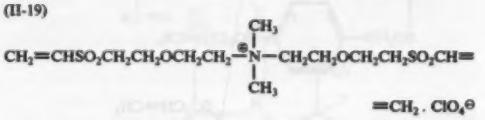
(II-14) 

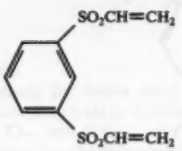
(II-15) 

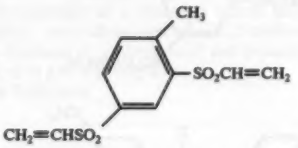
(II-16) 

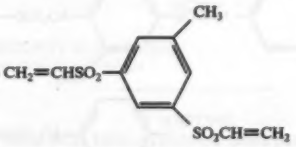
(II-17) 

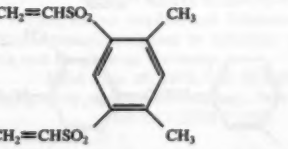
(II-18) 

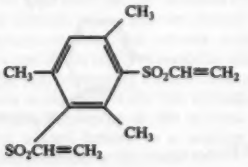
(II-19) 

(II-20) 

(II-21) 

(II-22) 

(II-23) 

(II-24) 

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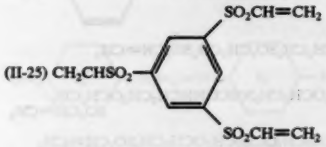
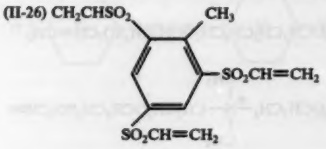
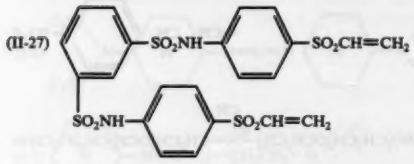
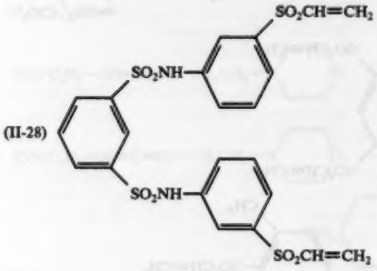
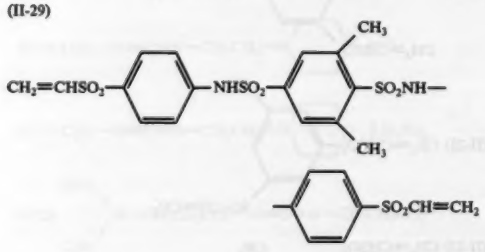
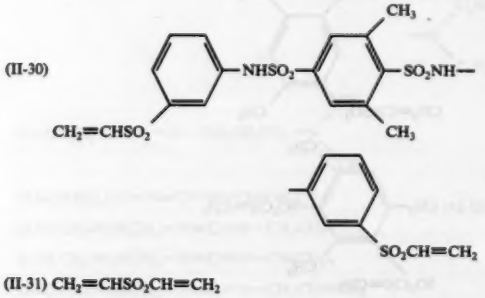
(II-25) 

(II-26) 

(II-27) 

(II-28) 

(II-29) 

(II-30) 

(II-31) $CH_2{=}CHSO_2CH{=}CH_2$

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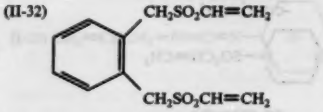
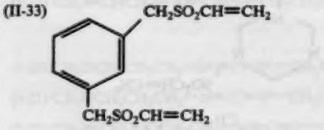
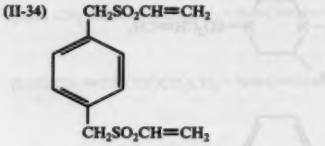
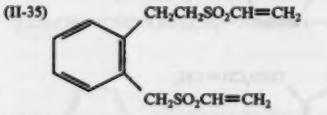
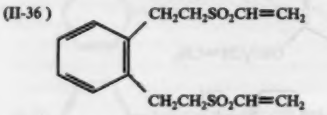
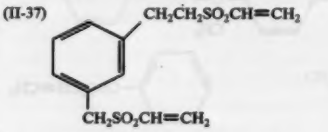
(II-32) 

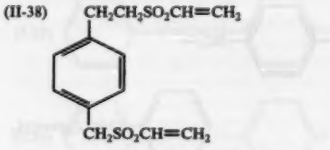
(II-33) 

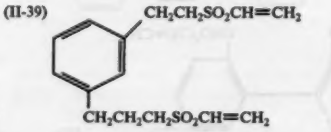
(II-34) 

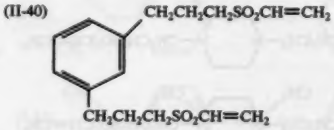
(II-35) 

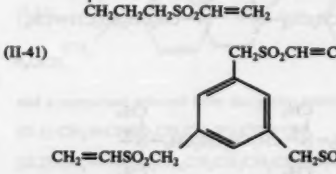
(II-36) 

(II-37) 

(II-38) 

(II-39) 

(II-40) 

(II-41) 

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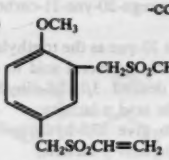

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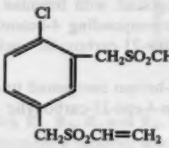

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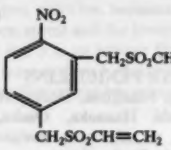

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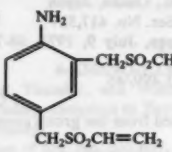
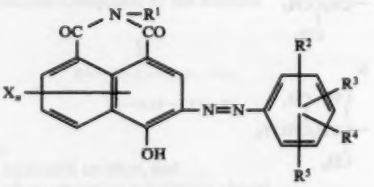


4,057,539
AZO COMPOUNDS CONTAINING A NAPHTHALIC IMIDE COUPLER

Seiichi Imahori, Komae; Masaharu Kaneko, and Yoshiaki Kato, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 312,104, Dec. 4, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 555,726
Claims priority, application Japan, Dec. 3, 1971, 46-97730
Int. Cl.[2] C09B *29/36*
U.S. Cl. 260—155 **16 Claims**

1. An azo dye having the formula (1):



wherein R^1 represents hydrogen, methyl, ethyl, propyl, butyl, β-hydroxyethyl, (C_1–C_3)alkoxy(C_2–C_3)alkyl, methoxycarbonylmethyl, acetylethyl, hydroxyethylaminoethyl, cyanoethyl, N,N-di(C_1–C_2)alkylamino(C_2–C_3)alkyl, ethylaminoethyl, chloroethyl, carboxymethyl, morpholinopropyl, cyclohexyl, phenethyl, benzyl, phenyl, chlorophenyl, methoxyphenyl, nitrophenyl, tolyl, xylyl, dimethylaminophenyl, and (C_1–C_3)alkyl containing an ammonium group wherein the ammonium nitrogen is quaternized by (C_1–C_3)alkyl groups or by an amino group in combination with alkyl groups, or wherein the ammonium nitrogen is the heterocyclic nitrogen atom of a morpholine ring or a pyridine ring, the ammonium group accompanied by an anion;

wherein R^2 is hydrogen, chlorine, bromine, nitro, cyano, carboxyl, methyl, trifluoromethyl, phenyl, β-hydroxylethyl, (C_1–C_2)alkoxy, ($C_1C_2$and C_4)alkoxycarbonyl, acetyl, benzoyl, acetylamino, benzoylamino, (C_1–C_2)alkylsulfonyl, phenylsulfonyl, di(C_1–C_2)alkylcarbamoyl, chlorophenoxy, dimethylaminosulfonyl, diethylaminosulfonyl, dibutylaminosulfonyl, or aminocarbonyl; R^3 is hydrogen, cyano, nitro, chlorine, bromine, methoxy or trifluoromethyl; R^4 is hydrogen, chlorine or nitro; and R^5 is hydrogen; and

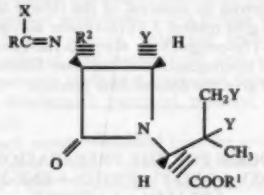
wherein, when $n = 1$, X is chlorine, bromine and nitro; when $n = 2$, X is bromine or nitro and n has a value from 0–2.

4,057,540
4-CHLOROAZETIDINONE-1-(2',3'-DICHLOROISOPROPYL) ACETATES AND PROCESS FOR PREPARING SAME

Ronald G. Micetich, Edmonton, Canada; Robert B. Morin, Warren, N.J., and Kenneth E. Wilson, Edmonton, Canada, assignors to Connlab Holdings Limited, Ontario, Canada

Filed Mar. 17, 1976, Ser. No. 667,825
Claims priority, application United Kingdom, Apr. 22, 1975, 16582/75
Int. Cl.[2] C07D *205/08, 513/04, 417/12*
U.S. Cl. 260—239 A **5 Claims**

1. A compound of the general formula:



wherein:

R stands for lower alkyl, phenyl, phenyloxyloweralkyl, phenylloweralkyl, 2-thiophenemethyl, 5-tetrazolylmethyl, R^3O— and R^3S—, wherein: R^3 stands for lower alkyl, phenyl or phenyllower-alkyl;

R^1 is hydrogen or a cleavable radical selected from lower alkyl, loweralkoxymethyl, 2,2,2-trichloroethyl, benzyl, p-halobenzyl, p-nitrobenzyl and p-methoxybenzyl, benzhydryl and trimethylsilyl;

R^2 is hydrogen;

is RCONH or phthalimido

Y is chloro or bromo.

4,057,541
METHOD FOR ISOLATION OF 3-HYDROXY STEROIDS AND 3-KETO STEROIDS

Alfred Weber; Rudolf Muller, and Johannes Kurzidim, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed June 25, 1976, Ser. No. 699,790
Claims priority, application Germany, June 30, 1975, 2529521
Int. Cl.[2] C07J *71/00*
U.S. Cl. 260—239.55 A **9 Claims**

1. In a process for the isolation of 3-hydroxy steroids and 3-keto steroids from a mixture thereof with lipids by dissolving the mixture in an organic solvent, mixing the dissolved mixture with a metal salt to form insoluble adducts of the steroids and a metal salt, separating the insoluble adducts, and splitting the adducts to regenerate the free steroid, the improvement which comprises employing as the solvent methyl isobutyl ketone, methyl n-amyl ketone or a mixture thereof and employing calcium bromide as the metal salt.

4,057,542

PROCESS FOR THE PREPARATION OF 17β-HYDROXY-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONE

Hugh L. Dryden, Jr., Deerfield; Mike G. Scaros, Arlington Heights, and Thomas J. Telinski, Chicago, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Aug. 30, 1976, Ser. No. 718,643
Int. Cl.² C07J *21/00*
U.S. Cl. 260—239.55 C **11 Claims**

1. A process for the preparation of 17β-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactone which comprises:

a. Reacting 17α-ethynyl-17β-hydroxyandrost-4-en-3-one with an appropriate vic-glycol containing up to 6 carbon atoms to give the corresponding 3,3-[vic-(lower alkylene)-dioxy] 5- or 4-unsaturated compound;

b. Reacting the ketal with a (lower alkyl) vinyl ether in the presence of an acid catalyst to give the corresponding 17β-[1-(lower alkoxy)ethoxy]-3,3-[vic-(lower alkylene)dioxy]-17α-ethynylandrost-(5- or 4-) ene;

c. Reaction of the ketal-acetal with an alkyl lithium or a Grignard reagent followed by treatment with carbon dioxide to give the corresponding salt of 17β-[1-(lower alkoxy)ethoxy]-3,3-[vic-(lower alkylene)dioxy]-17α-pregn-(5- or 4-)en-20-yne-21-carboxylic acid;

d. Conversion of the acid salt to the corresponding methyl ester followed by removal of the (lower alkoxy)-ethoxy group to give methyl 3,3-[vic-(lower alkylen)dioxy]-17β-hydroxy-17α-pregn-(5- or 4-)en-20-yne-21-carboxylate;

e. Catalytic hydrogenation of the ester followed by acidification to give the desired final product.

4,057,543

PROCESS FOR THE PREPARATION OF 17β-HYDROXY-3-OXO-17α-PREGN-4-ENE-21-CARBOXYLIC ACID γ-LACTONE

Hugh L. Dryden, Jr., and Charles S. Markos, both of Deerfield, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed July 1, 1976, Ser. No. 701,463
Int. Cl.² C07J *71/00, 1/00*
U.S. Cl. 260—239.57 **4 Claims**

1. A process for the preparation of 17β-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactone which comprises:

a. mineral acid hydrolysis of sarsasaponin to afford sarsasapogenin;

b. acetylation of sarsasapogenin followed by oxidation using a mixture of chromic acid in water and acetic acid to afford 3β-acetoxy-5β-pregn-16-en-20-one;

c. conversion of the resulting 3β-acetoxy-5β-pregn-16-en-20-one to the corresponding oxime using hydroxylamine hydrochloride;

d. rearrangement of that oxime using phosphoryl chloride and triethylamine to aford 3β-acetoxy-5β-androstan-17-one;

e. alkaline hydrolysis of 3β-acetoxy-5β-androstan-17-one to afford the corresponding 3β-hydroxy compound;

f. reacting the 3-hydroxy compound with a lower alkyl vinyl ether in the presence of an acid catalyst to give a 3β-(1-lower alkoxyethoxy)-5β-androstan-17-one;

g. ethynylating the ketone by means of an ethynylating agent selected from the group consisting of potassium hydroxide and acetylene, ethynylmagnesium chloride, lithium acetylide, or sodium acetylide to give the corresponding 17α-ethynyl-17β-hydroxy compound;

h. treating this 17β-hydroxy compound with a lower alkyl vinyl ether in the presence of an acid catalyst to give the corresponding 3β,17β-bis[1-(lower alkoxy)ethoxy]-17α-ethynyl-5β-pregnane;

i. treating the resultant compound with a reagent selected from the group consisting of a Grignard reagent and lithium alkyl followed by carbonation to give 3β,17β-bis[1-(lower alkoxy)ethoxy]-5β-pregn-20-yne-21-carboxylic acid;

j. hydrolyzing the compound under mineral acid conditions to give 3β,17β-dihydroxy-5β-pregn-20-yne-21-carboxylic acid;

k. catalytic hydrogenation of this 20-yne as the triethylamine salt followed by treatment with a mineral acid to effect lactonization and give the desired 3β,17β-dihydroxy-5β,17α-pregnane-21-carboxylic acid γ-lactone;

l. oxidation of the γ-lactone to give 17β-hydroxy-3-oxo-5β,17α-pregnane-21-carboxylic acid γ-lactone;

m. treatment of the 3-oxo compound with bromine in an inert solvent to afford the corresponding 4-bromo-17β-hydroxy-3-oxo-5β,17α-pregnane-21-carboxylic acid γ-lactone;

n. dehydrobromination of the 4-bromo compound to afford 17β-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactone.

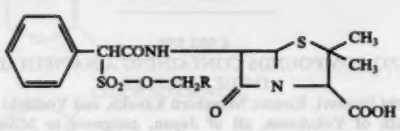
4,057,544

α-ALKYLSULFOBENZYL PENICILLINS

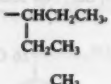
Keiichi Sugimoto, Kawanishi; Koji Nishijima, Osaka; Hiroshi Akimoto, Nishinomiya; Tadashi Hanaoka, Osaka, and Nobuharu Kakeya, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

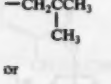
Filed Nov. 20, 1973, Ser. No. 417,527
Claims priority, application Japan, July 9, 1973, 48-77262; July 13, 1973, 48-79606
Int. Cl.² C07D *499/46*
U.S. Cl. 260—239.1 **7 Claims**

1. A penicillin compound selected from the group consisting of a compound of the formula

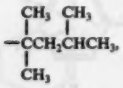


wherein R is isopropyl,





or



and a pharmaceutically acceptable salt thereof.

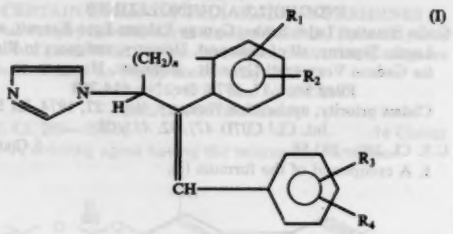
4,057,545

IMIDAZOLE DERIVATIVES

Klaus Gutsche, Rellingen; Friedrich-Wilhelm Kohlmann, and Peter Scharwächter, both of Moorrege, all of Germany, assignors to Nordmark-Werke GmbH Hamburg, Uetersen, Germany

Filed Oct. 18, 1976, Ser. No. 733,349
Claims priority, application Germany, Nov. 6, 1975, 2549798
Int. Cl.² C07D *233/56, 233/64*
U.S. Cl. 542—428 **9 Claims**

1. An inidazole derivative corresponding to the general formula



(I)

in which R_1, R_2, R_3 and R_4, which may be the same or different, represent a member selected from the group consisting of hydrogen, chlorine, bromine, the lower alkyl groups with 1 to 4 carbon atoms and the lower alkoxy groups with 1 to 4 carbon atoms and n is an integer from 0 to 2, the velencies liberated being saturated by hydrogen where $n = 0$, and their pharmacologically compatible salts with acids.

4,057,546

4-AMINO-1,2,4-TRIAZIN-5-ONES

Helmut Timmler, and Wilfried Draber, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

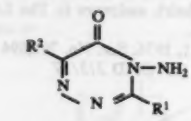
Division of Ser. No. 531,637, Dec. 11, 1974, Pat. No. 3,959,372. This application Oct. 23, 1975, Ser. No. 625,277

Claims priority, application Germany, Dec. 24, 1973, 2364474

Int. Cl.² C07D *253/06*

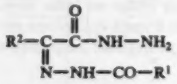
U.S. Cl. 544—182 **7 Claims**

1. Process for the preparation of a 4-amino-1,2,4-triazin-5-one compound of the formula:



(III)

which process comprises heating a glyoxylic acid hydrazide-2-acylhydrazone compound of the formula



(I)

wherein

R^1 is hydrogen or alkyl, and

R^2 is alkyl, phenyl or substituted phenyl

in the presence of a polar organic solvent at a temperature of 60° to 150° C.

4,057,547

AZABICYCLIC COMPOUNDS, AND PRODUCTION THEREOF

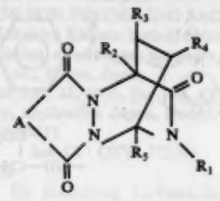
Seymour Levine, North Brunswick, and Vinayak V. Kane, Princeton, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Feb. 2, 1976, Ser. No. 654,311

Int. Cl.² C07D *487/04, 253/08*

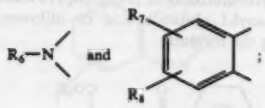
U.S. Cl. 544—184 **28 Claims**

1. A compound having the formula:



wherein:

A is a member selected from the group consisting of



R_1 is a member selected from the group consisting of loweralkyl, phenyl, substituted phenyl wherein the substituent is 1–3 groups selected from loweralkyl, loweralkoxy, halo and amino, phenyl loweralkyl, substituted phenyl loweralkyl wherein the substituent is 1–3 groups selected from loweralkyl, loweralkoxy, halo and amino, loweralkylaminodophenyl, and heterocyclic aryl selected from pyridyl, quinolyl, imidazolyl, pyrazinyl, pyrrolyl, thienyl, thiazolyl, thiadiazolyl, pyrazolyl, triazolyl, oxazolyl and pyrimidinyl;

R_2–R_5 are each members selected from the group consisting of hydrogen, halo, cyano, COOR′, CONR′R″, $CH_2NR'R''$, OR‴, loweralkyl, phenyl, substituted phenyl wherein the substituent is 1–3 groups selected from loweralkyl, loweralkoxy, halo and amino, phenyl loweralkyl, and substituted phenyl loweralkyl wherein the substituent is 1–3 groups selected from loweralkyl, loweralkoxy, halo and amino, said R′ and R″ each being a member selected from the group consisting of hydrogen and loweralkyl and said R‴ being a member selected from the group consisting of hydrogen, loweralkyl, phenyl and substituted phenyl wherein the substituent is 1–3 groups selected from loweralkyl, loweralkoxy, halo and amino;

R_6 is a member selected from the group consisting of loweralkyl, phenyl, and substituted phenyl wherein the substituent is 1–3 groups selected from lowerakyl, loweralkoxy, halo and amino; and

R_7 and R_8 are each members selected from the group consisting of hydrogen, halo, loweralkyl, loweralkoxy, and amino; and

pharmaceutically acceptable quaternary salts thereof wherein R_1 is pyridyl, quinolyl, imidazolyl, pyrazinyl, pyrrolyl, thiazolyl, thiadiazolyl, pyrazolyl, triazolyl, oxazolyl or pyrimidinyl.

4,057,548

PROCESS FOR PREPARING METHOTREXATE OR AN N-SUBSTITUTED DERIVATIVE THEREOF AND/OR A DI (LOWER) ALKYL ESTER THEREOF AND PRECURSOR THEREFOR

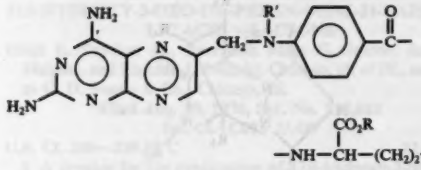
Jacek Wiecko, 7031 Ethel St., St. Louis, Mo. 63117

Continuation-in-part of Ser. No. 631,134, Nov. 11, 1975, abandoned. This application Mar. 30, 1976, Ser. No. 671,960

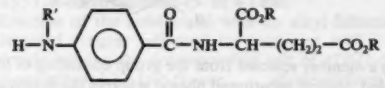
Int. Cl.² C07D *471/04*

U.S. Cl. 260—250 BC **6 Claims**

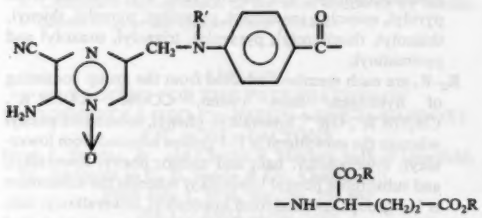
1. A process for preparing a compound having the formula:



wherein R is hydrogen or a lower alkyl group and R′ is hydrogen or a methyl group which consists essentially of the steps of (a) reacting in one step the compounds (1) aminomalononitrile, (2) β-bromopyruvaldoxime or β-chloropyruvaldoxime and (3) a p-aminobenzoyl-L-glutamic acid or di(lower) alkyl ester thereof having the formula:



wherein R is a lower alkyl group or hydrogen and R′ is a methyl group or hydrogen to form the pyrazine oxide precursor having the formula:



wherein R is a lower alkyl group or hydrogen and R′ is a methyl group or hydrogen; (b) treating said compound with either titanium trichloride or iodoformamidinium iodide to deoxygenate said compound; and (c) treating said deoxygenated compound with a guanidine salt of a weak organic acid.

4,057,549

TRIARYLPROPYL-AZABICYCLOOCTANES

Gilbert W. Adelstein, Evanston; Esam Z. Dajani, Buffalo Grove, and Chung Hwai Yen, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 568,439, April 16, 1975, Pat. No. 3,998,832. This application Oct. 18, 1976, Ser. No. 733,503

Int. Cl.² C07D *221/22*

U.S. Cl. 260—293.54 **4 Claims**

3. A compound according to claim 1 which is 2-[3,3-diphenyl-3-(2-thienyl)propyl]-2-azabicyclo[2.2.2]-octane.

4,057,550

NITROGEN-CONTAINING POLYCYCLIC COMPOUNDS

Csaba Szántay; Lajos Szabó; György Kállius; Egon Karpati, and Läszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Sept. 17, 1975, Ser. No. 614,240

Claims priority, application Hungary, Sept. 27, 1974, RI 547

Int. Cl.² C07D *471/02, 455/02*

U.S. Cl. 260—293.55 **2 Claims**

1. 14,15-Dihydro-14-cyano-eburnamenine-(3β,16α).

2. 14,15-Dihydro-14-cyano-21-ethyl-eburnamenine-(3β,16α).

4,057,551

INDOLO[2,3-A]QUINOLIZINES

Csaba Szantay; Lajos Szabo; Gyorgy Kalaus; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

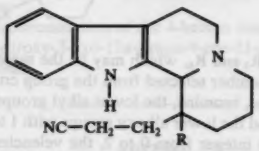
Filed Sept. 17, 1975, Ser. No. 614,240

Claims priority, application Hungary, Sept. 27, 1974, RI 545

Int. Cl.² C07D *471/02, 455/02*

U.S. Cl. 260—293.55 **5 Claims**

1. A compound of the formula (I),



(I)

wherein R is an alkyl group having 1 to 6 carbon atoms, and a pharmaceutically acceptable salt thereof.

4,057,552

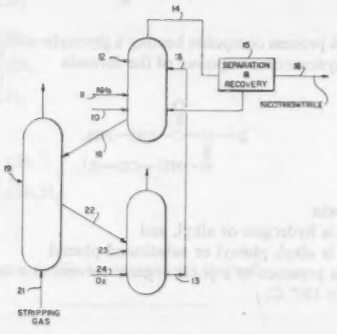
PRODUCTION OF CYANOPYRIDINES FROM PIPERIDINES

Hermann Richtzenhain, Much-Schwellenbach, Germany, and Paul Janssen, deceased, late of Bensberg-Refrath, Germany (by Almuth Janssen, heir), assignors to The Lummus Company, Bloomfield, N.J.

Filed July 1, 1976, Ser. No. 701,694

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **6 Claims**



1. A process for producing a cyano-pyridine, comprising: contacting an alkyl piperidine with ammonia in the absence of any gaseous oxygen and in the presence of oxidized vanadia supported on a porous support, said support containing from about 25% to about 75%, by weight, of the vanadia having been placed in molten form substantially entirely within the pores of the support, the support having a surface area greater than about 50 m^2/gm and a porosity greater than about 0.4 cc/gm, said support being selected from the group consisting of gamma-alumina and silica-alumina.

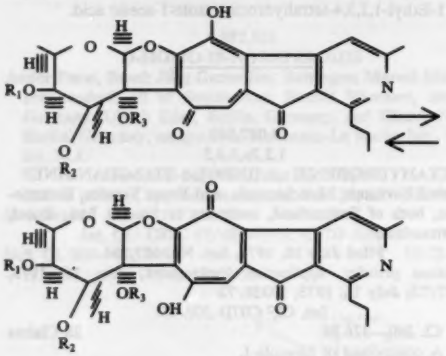
4,057,553

CERTAIN PYRANO-FURO-AZULENO-PYRIDINES

Julius Berger, Passaic; Karen Emalyn Reichelt, Belleville, both of N.J., and Willy Schüep, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

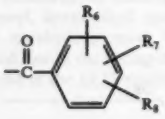
Filed Aug. 26, 1976, Ser. No. 717,857
Int. Cl.[2] C07D *521/00*
U.S. Cl. 260—295 A 14 Claims

1. A coloring agent having the tautomeric formulae:



wherein R_1 and R_2 are individually hydrogen or taken together form

R_3 is hydrogen or



R_4 and R_5 are lower alkyl or taken together with attached carbon atoms forms cycloalkyl from 3 to 8 carbon atoms; and R_6, R_7 and R_8 are hydrogen, halogen or nitro.

4,057,554

QUATERNARY AMMONIUM SALTS OF POLYEPIHALOHYDRIN

Derek Redmore, Ballwin, and Frederick T. Welge, Affton, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 301,176, Oct. 26, 1972, Pat. No. 3,885,913.
This application Mar. 10, 1975, Ser. No. 556,570
Int. Cl.[2] C08G *65/32*
U.S. Cl. 260—296 D 7 Claims

1. Polyquaternaries of polyepichlorohydrins and tertiary amine where the polyquaternary contains both heterocyclic and aliphatic tertiary amines and is formed by the quaternization of the polyepichlorohydrin with about one mol of a mixture of about ¼ to ½ mol of an aliphatic tertiary amine and correspondingly about ¾ to ½ mol of a heterocyclic amine which is pyridine, quinoline, isoquinoline, alkyl derivatives thereof or mixtures thereof per equivalent of polyepichlorohydrin.

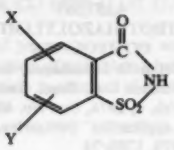
4,057,555

PROCESS FOR PRODUCING SACCHARIN

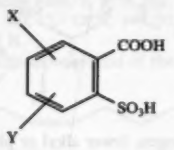
Wataro Koike; Takahiro Kimoto, both of Shizuoka, and Sadayoshi Matsui, Shimizu, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1976, Ser. No. 677,256
Claims priority, application Japan, Dec. 6, 1975, 50-145246; June 11, 1975, 50-70311
Int. Cl.[2] C07D *275/06*
U.S. Cl. 260—301 11 Claims

1. A process for producing 1.2-benzoisothiazole3-on-1.1-dioxide having the formula:



wherein X represents hydrogen, halogen, nitro, lower alkyl or lower alkoxy and Y represents hydrogen, halogen, lower alkyl, or lower alkoxy which comprises: (a) reacting phosgene with an o-sulfobenzoic acid compound having the formula:



or an alkali metal salt or alkaline earth metal salt thereof in the presence of dimethylformamide, thereby producing a mixture of a dichlorotolylsultone and a chlorosulfonylbenzoylchloride; (b) reacting the reaction products of step (a) with an alcohol having the formula ROH wherein R represents a lower alkyl group; (c) reacting the reaction product of step (b) with ammonia to form the ammonium salt of said 1.2-benzoisothiazole-3-on-1.1dioxide; and converting said ammonium salt to said 1.2-benzoisothiazole-3-on-1.1-dioxide.

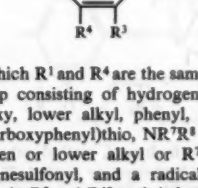
4,057,556

TROPONYL-OXAMIC ACID DERIVATIVES

Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison Ltd., Montreal, Canada

Filed June 17, 1976, Ser. No. 697,296
Int. Cl.[2] C07C *103/42*
U.S. Cl. 424—305 26 Claims

1. A compound of formula I



(I)

in which R^1 and R^4 are the same or different selected from the group consisting of hydrogen, halo, trifluoromethyl, lower alkoxy, lower alkyl, phenyl, hydroxy, phenoxy, mercapto, (2-carboxyphenyl)thio, NR^7R^8 wherein R^7 and R^8 each is hydrogen or lower alkyl or R^7 is lower alkyl and R^8 is p-toluenesulfonyl, and a radical of formula $NR^9COCOOR^{10}$ wherein R^9 and R^{10} each is hydrogen or lower alkyl; and R^2, R^3, R^5 and R^6 are the same or different selected from the group consisting of hydrogen, halo, trifluoromethyl, lower alkoxy,

lower alkyl, phenyl, hydroxy, phenoxy, mercapto, (2-carboxyphenyl)thio and NR^7R^8 wherein R^7 and R^8 each is hydrogen or lower alkyl or R^7 is lower alkyl and R^8 is p-toluenesulfonyl; with the proviso that at least one of R^1 and R^4 must be a radical of formula $NR^9COCOOR^{10}$ wherein R^9 and R^{10} are as defined herein; or a therapeutically acceptable salt thereof.

4,057,557

CERTAIN 5-NITROTHIAZOLYLIMIDAZOLIDINE COMPOUNDS

Gerd Ascher, and Hellmuth Reinshagen, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

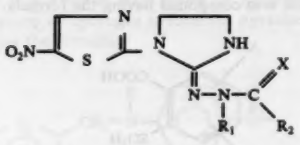
Filed Feb. 6, 1976, Ser. No. 655,721

Claims priority, application Switzerland, Feb. 13, 1975, 1776/75; Feb. 13, 1975, 1780/75

Int. Cl.² C07D *417/04*

U.S. Cl. 260—306.8 R **12 Claims**

1. Compounds of formula I,



I

in which R_1 is hydrogen, lower alkyl or phenyl,

R_2 is hydrogen, lower alkyl or alkoxy, trifluoromethyl, the group —CH=CH—COOH or a group $—N(R_3)(R_4)$, in which R_3 and P_4, which may be the same or different, each signifies hydrogen or lower alkyl, and

X is oxygen, sulphur or imino, provided that when R_2 is lower alkyl or —CH=CH—COOH, then X is oxygen,

or a chemotherapeutically acceptable acid addition salt thereof.

4,057,558

HALOGENATED BIS-ACRYLATES

Jurgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

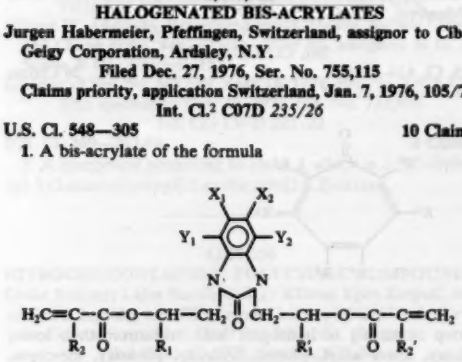
Filed Dec. 27, 1976, Ser. No. 755,115

Claims priority, application Switzerland, Jan. 7, 1976, 105/76

Int. Cl.² C07D *235/26*

U.S. Cl. 548—305 **10 Claims**

1. A bis-acrylate of the formula



wherein R_1 and R_1' each denote hydrogen, methyl, ethyl or phenyl, R_2 and R_2' each denote hydrogen or methyl, X_1 denotes chlorine or bromine and X_2, Y_1 and Y_2 denote hydrogen, chlorine or bromine and, when X_2 denotes hydrogen, Y_1 and Y_2 also denote hydrogen.

4,057,559

CARBAZOLE ACETIC ACID DERIVATIVES

Andre A. Asselin, Lemoyne; Leslie G. Humber, and Thomas A. Dobson, both of Dollard des Ormeaux, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 402,240, Oct. 1, 1973, abandoned. This application May 7, 1975, Ser. No. 575,552

Int. Cl.² C07D *209/86*

U.S. Cl. 260—315 **8 Claims**

1. 1-Ethyl-1,2,3,4-tetrahydrocarbazole-1-acetic acid.

4,057,560

1,2,2a,3,4,5 HEXAHYDROBENZ[c,d,]INDOL-1-YL-2-GUANDINES

Gerhard Bormann, Munchenstein, and Franz Troxler, Bottmingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

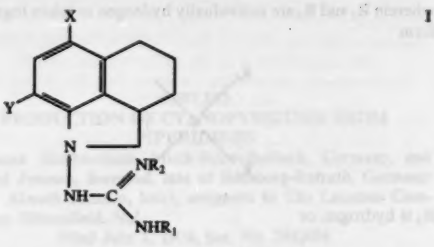
Filed July 10, 1974, Ser. No. 487,194

Claims priority, application Switzerland, July 16, 1973, 10327/73; July 16, 1973, 10328/73

Int. Cl.² C07D *209/90*

U.S. Cl. 260—326.86 **28 Claims**

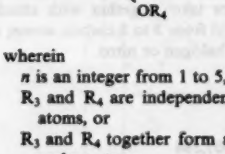
1. A compound of formula I,



I

wherein

R_1 is hydroxy, or



wherein

n is an integer from 1 to 5, and

R_3 and R_4 are independently alkyl of 1 to 4 carbon atoms, or

R_3 and R_4 together form an alkylene chain of 2 or 3 carbon atoms,

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, or phenylalkyl of 7 to 9 carbon atoms mono- or disubstituted on the phenyl radical by halogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and

either

X is hydrogen, and

Y is methyl,

or

X is methylthio or dialkylamino, wherein the alkyl chains are independently of 1 to 4 carbon atoms, and

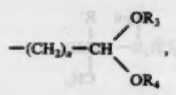
Y is hydrogen,

or

X is chlorine or bromine, and

Y is chlorine,

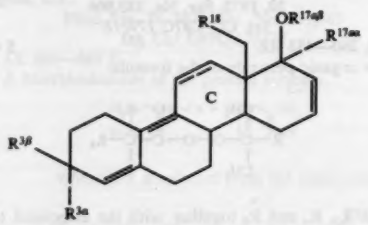
or, when R_1 is



X also signifies hydrogen, chlorine, bromine or methyl, and Y signifies hydrogen
or a pharmaceutically acceptable acid addition salt thereof.

4,057,561
D-HOMO-19-NORSTEROIDS
Andor Furst, Basel; Jürg Gutzwiller, Bettingen; Marcel Müller, Frenkendorf, all of Switzerland; Rudolf Wiechert, Berlin, Germany; Ulrich Eder, Berlin, Germany, and Günter Neef, Berlin, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Feb. 22, 1977, Ser. No. 770,433
Claims priority, application Austria, Feb. 23, 1976, 1269/76; Switzerland, Jan. 3, 1977, 2/77
Int. Cl.² C07C *49/48, 69/02;* C07D *309/22*
U.S. Cl. 260—345.9 S 16 Claims

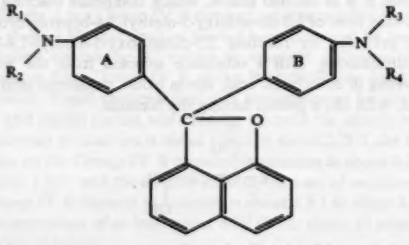
1. A compound of the formula



wherein $R^{3\alpha}$ is hydrogen, $R^{3\beta}$ is hydroxy, lower alkanoyloxy or aroyloxy and $R^{3\alpha}$ and $R^{3\beta}$ taken together are oxo; $R^{17\alpha\alpha}$ is hydrogen, lower alkyl, ethynyl, vinyl, allyl, methallyl, propadienyl, 1-propynyl, butadiynyl or chloroethynyl; $R^{17\alpha\beta}$ is hydrogen, alkanoyl, aroyl, lower alkyl, cycloalkyl-lower-alkyl, benzyl, furfuryl or tetrahydropyranyl; R^{18} is hydrogen or methyl and the dotted line in the C-ring denotes an additional carbon to carbon bond in the 11,12-position.

4,057,562
CERTAIN NAPHTHOFURANS AND METHOD FOR THEIR MANUFACTURE
Heinz Balli, Riehen, and Albert Egger, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 524,850, Nov. 18, 1974, Pat. No. 3,974,180. This application Apr. 2, 1976, Ser. No. 673,240
Claims priority, application Switzerland, Nov. 27, 1973, 16635/73
Int. Cl.² C07D *307/92*
U.S. Cl. 260—346.71 6 Claims

1. A furan of the formula



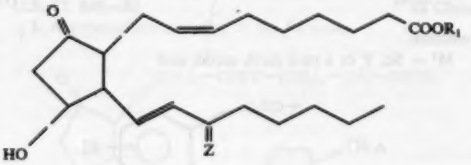
in which R_1, R_2, R_3 and R_4 are independently alkyl of 1 to 4 carbon atoms or phenyl;
and the phenyl rings A and B are independently unsubstituted or are substituted by alkyl of 1 to 4 carbon atoms or halo.

4,057,563
PREPARATION OF DYE CYANIDES
Lyman Chalkley, 6626 Tyrian St., La Jolla, Calif. 92037
Filed May 24, 1976, Ser. No. 689,067
Int. Cl.² C09B *11/10, 11/06*
U.S. Cl. 260—390 10 Claims

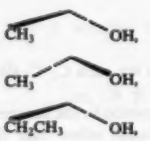
1. The process of preparation of an amino triarylmethane dye cyanide by reaction of an amino triarylmethane dye base with hydrogen cyanide in absence of additional acid.

4,057,564
2a, 2b-DIHOMO-15-ALKYL-PGE₂ ANALOGS
Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 511,220, Oct. 2, 1974, Pat. No. 3,974,195. This application Mar. 3, 1976, Ser. No. 663,566
Int. Cl.² G07C *177/00*
U.S. Cl. 260—410.9 R 7 Claims

1. An optically active compound of the formula:

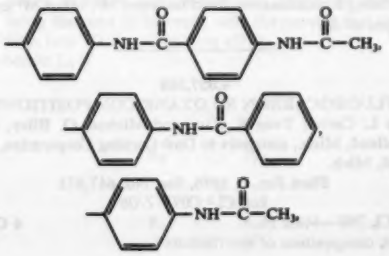


wherein Z is



or

and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive,



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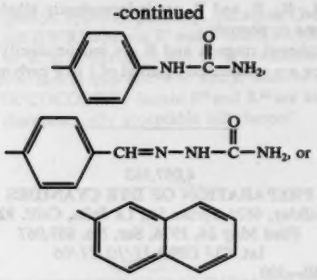


or pharmacologically acceptable salts thereof when R_1 is hydrogen.

4,057,565

2-DIALKYLAMINOBENZYL AND 2-DIALKYLAMINOMETHYLPHENYL DERIVATIVES OF SELECTED TRANSITION METALS

Leo Ernest Manzer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

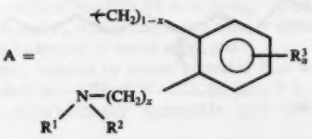
Filed July 22, 1975, Ser. No. 597,981
Int. Cl.² C07F 5/00, 7/00, 7/28, 11/00
U.S. Cl. 260—429 R **11 Claims**

1. Transition metal compounds of the formulae

$$M^1A_3 \quad (1)$$

wherein

M^1 = Sc, Y or a rare earth metal, and



where

x = 0 or 1

R^1, R^2 and the R^3's are each C_1–C_8 alkyl, and

n = 0, 1, 2, 3 or 3 + x,

when x = 0, the position in the benzene ring adjacent to the —NR^1R^2 substituent, other than that occupied by the —CH_2— substituent, being unsubstituted,

$$M^2A_2 \quad (2)$$

wherein

M^2 = Cr or Mo, and

$$M^3A_4 \quad (3)$$

wherein

M^3 = Ti, Zr or Hf,

there being a coordination bond between M^1, M^2 or M^3 and the nitrogen of A.

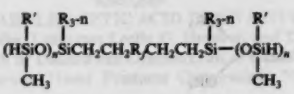
4,057,566

FLUOROCARBON SILOXANE COMPOSITIONS

Philip L. Carter; Yung K. Kim, and Michael O. Riley, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 8, 1976, Ser. No. 647,473
Int. Cl.² C07F 7/08
U.S. Cl. 260—448.2 H **6 Claims**

1. A composition of the formula



wherein each R and R′ is independently methyl, phenyl, or 3,3,3-trifluoropropyl, R_f is a perfluoroalkylene radical of 2 to 10 carbon atoms, a perfluorocycloalkylene radical, or a perfluoroalkylene radical of 2 to 10 carbon atoms or a perfluorocycloalkylene radical containing one or more —C—O—C— linkages and each n is independently 1, 2, or 3.

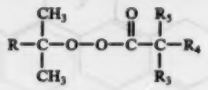
4,057,567

POLYMERIZATION METHOD AND T-ALKYL PERESTERS OF T-HYDROPEROXIDES FOR USE THEREIN

Ronald L. Friedman, San Rafael, and Roger N. Lewis, Martinez, both of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 157,683, June 28, 1971, Pat. No. 3,726,847, which is a continuation-in-part of Ser. No. 725,931, May 1, 1968, Pat. No. 3,624,123. This application Feb. 20, 1973, Ser. No. 333,904
Int. Cl.² C07C 179/18
U.S. Cl. 260—453 RZ **5 Claims**

1. An organic peroxide of the formula:



wherein R_3, R_4 and R_5 together with the associated tertiary carbon atom and adjacent carbonyl group form a neodecanoate group; and R is selected from 2,2-dimethyl propyl and straight chain alkyl of 2–5 carbon atoms.

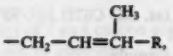
4,057,568

PROCESS FOR SYNTHESIS OF BORIC ACID ESTER

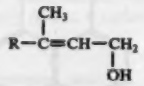
Shizumasa Kijima; Isao Yamatu, both of Tokyo; Kimio Hamamura, Kashiwa; Norio Minami, Kawasaki; Youji Yamagishi, and Yuichi Inai, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 640,305, Dec. 12, 1975, Pat. No. 3,998,858. This application Sept. 22, 1976, Ser. No. 725,427
Int. Cl.² C07F 5/04
U.S. Cl. 260—462 R **14 Claims**

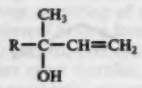
1. A process for synthesizing boric acid ester of 2,3-dimethoxy-5-methyl-6-substituted-1,4-benzohydroquinone, wherein the substituent at the 6 position is



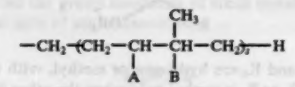
wherein R is as defined below, which comprises reacting (A) boric acid ester of 2,3-dimethoxy-5-methyl-1,4-benzohydroquinone prepared by reacting 2,3-dimethoxy-5-methyl-1,4-benzohydroquinone with a substance selected from the group consisting of orthoboric acid, boron oxide, metaboric acid and borax, with (B) a prenol having the formula



or an isoprenol having the formula



wherein R is



in which *s* is an integer of from zero to 11, and A and B are hydrogens or A—B form a direct bond or a reactive derivative of said prenol or said isoprenol selected from the group consisting of lower alkyl ethers, esters and halides.

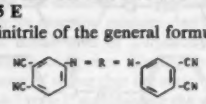
4,057,569

BISORTHODINITRILES

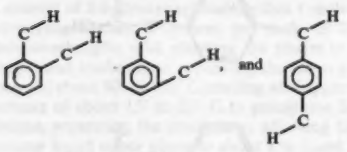
James R. Griffith, Riverdale Heights, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1976, Ser. No. 681,087
Int. Cl.² C07C *121/78*
U.S. Cl. 260—465 E **3 Claims**

1. A bisorthodinitrile of the general formula:



wherein R is selected from the class consisting of



4,057,570

PROCESS FOR PREPARING ACRYLONITRILE

Robert A. Innes, Pittsburgh, and Anthony J. Perrotta, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 645,419, Dec. 30, 1975. This application Aug. 18, 1976, Ser. No. 715,281
Int. Cl.² C07C *120/14*
U.S. Cl. 260—465.3 **13 Claims**

1. A process for preparing acrylonitrile which comprises reacting at an elevated temperature in the vapor phase propylene, oxygen and ammonia over a catalyst consisting essentially of a compound defined by the formula:

$$USb_{3-x}A_xO_{9-10}$$

wherein A is a Group IV B element, x is the number about 0.25 to about 1.50, said catalyst having been prepared by heating a mixture containing (1) oxides or uranium, antimony and an element from Group IV B of the Periodic Table or (2) compounds of said elements that will decompose or be converted to said oxides during said heating, wherein the atomic ratio of antimony to uranium is about 1.35:1 to about 2.75:1, the atomic ratio of the Group IV B element to uranium is about 0.25:1 to about 1.65:1 and the atomic ratio of the sum of antimony and Group IV B element to uranium is about 3.5:1 to about 2.5:1, at a temperature of at least about 850° C. for about 15 minutes to about 24 hours.

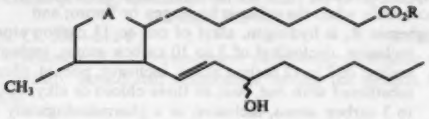
4,057,571

NOVEL 11-DEOXY-SUBSTITUTED PROSTAGLANDINS OF THE E AND F SERIES

Charles Vincent Grudzinskas, Garnerville, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 274,559, July 24, 1972. This application Feb. 24, 1975, Ser. No. 552,403
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 **1 Claim**

1. A compound of the structure:



wherein A is CHOH or C=O; and R is H or alkyl of from 1 to 12 carbon atoms.

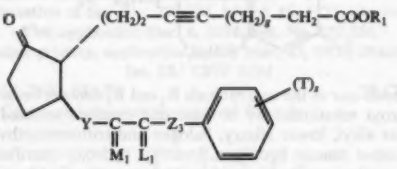
4,057,572

4,4,5,5-TETRADEHYDRO-ω-ARYL-11-DEOXY-PGE$_1$, ANALOGS

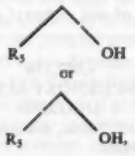
Chiu-Hong Lin, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 619,077, Oct. 2, 1975, Pat. No. 4,013,695. This application Nov. 4, 1976, Ser. No. 738,714
Int. Cl.² C07C *65/22*
U.S. Cl. 560—53 **32 Claims**

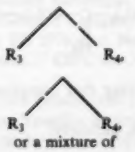
1. A prostaglandin analog of the formula



wherein *g* is one, 2, or 3; wherein Y is trans-CH=CH—; wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein Z_3 is oxa or methylene, with the proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl;
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein L_1 is



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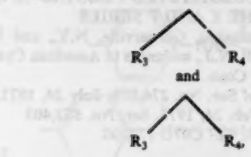


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,057,573

HYDROAROMATIC COMPOUNDS

Georges Haas, and Alberto Rossi, both of Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

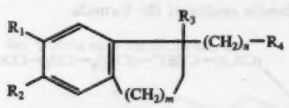
Filed Feb. 11, 1975, Ser. No. 548,956

Claims priority, application Switzerland, Feb. 14, 1974, 2094/74

Int. Cl.² C07C *69/76*

U.S. Cl. 560—52 **11 Claims**

1. A compound of the general formula



(I)

wherein one of the two radicals R_1 and R_2 denotes benzoyl, or benzoyl substituted by at least one member selected from lower alkyl, lower alkoxy, halogen and trifluoromethyl, and the other denotes hydrogen, hydroxy, hydroxy esterified by a lower alkanecarboxylic acid, or hydroxy etherified by a lower alkanol, R_3 denotes hydrogen, lower alkyl or lower hydroxyalkyl, R_4 denotes carboxyl, or carboxyl esterified by a lower alkanol or a lower alkanol which is substituted by hydroxy or lower alkoxy, *m* denotes 1 or 2 and *n* denotes 0 or 1, therapeutically acceptable salts of said carboxyl compounds.

4,057,574

2,2-DIFLUORO-16-PHENOXY-13,14-DIHYDRO-PGA$_2$ ANALOGS

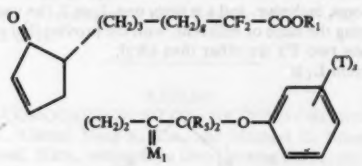
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 552,708, Feb. 25, 1975, Pat. No. 4,001,300. This application Sept. 17, 1976, Ser. No. 724,236

Int. Cl.² C07C *65/22*

U.S. Cl. 560—53 **58 Claims**

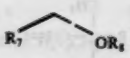
1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof,

wherein g is 2 to 4, inclusive;

wherein M_1 is

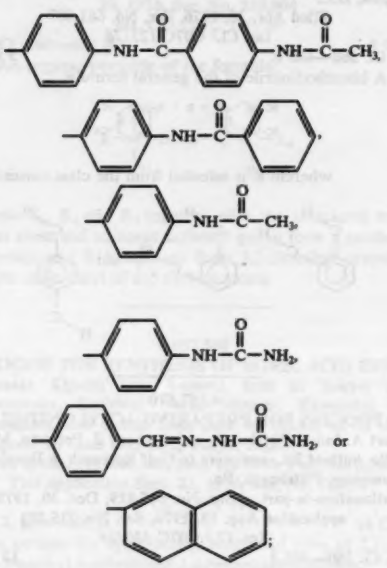


or

wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;

wherein T is alkyl of one to 3 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_4$ wherein R_4 is alkyl of one to 3 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation,



and

wherein R_5 is hydrogen or methyl, with the proviso that R_5 is methyl only when R_7 and R_8 are both hydrogen.

4,057,575

PROCESS FOR THE PREPARATION OF UNSATURATED ESTERS

Donald L. Klass, Barrington, Ill., assignor to Union Oil Company of California, Brea, Calif.

Continuation of Ser. No. 670,159, Sept. 25, 1967, abandoned, which is a continuation-in-part of Ser. No. 141,832, Sept. 29, 1961. This application June 23, 1976, Ser. No. 699,198

Int. Cl.² C07C *67/05*

U.S. Cl. 560—245 **11 Claims**

9. A vapor phase process for the preparation of unsaturated esters which comprises passing a substantially anhydrous gas mixture comprising (1) an unsaturated organic compound selected from the group consisting of alkenes and styrene, (2) a

carboxylic acid having the formula R'COOH wherein R' is selected from the group consisting of alkyl, aralkyl, aryl and carboxy derivatives thereof having from 1 to 17 carbon atoms per molecule, and (3) oxygen, over a Group VIII noble metal compound and a redox agent therefor, said noble metal compound and said redox agent being supported on a solid support, said gas mixture being contacted with said supported noble metal compound and redox agent in the presence of a member selected from the group consisting of alkali metal and alkaline earth metal salts of said alkanoic acid

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4,057,576

PROCESS FOR ISOLATING 2-HYDROXYNAPHTHALENE CARBOXYLIC ACIDS FROM REACTION MIXTURES OF THE ALKALI METAL SALTS OF 2-HYDROXYNAPHTHALENE WITH CARBON DIOXIDE

Wilfried Bachmann, Frankfurt am Main; Christian Gnabs, Kelkheim, Taunus; Kurt Janecka, Offenbach (Main); Eberhard Mundlos, Heusenstamm; Theodor Papenfuhs, Frankfurt am Main, and Gerhard Waese, Dietzenbach, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 3, 1975, Ser. No. 583,295
Claims priority, application Germany, June 4, 1974, 2426852
Int. Cl.² C07C 51/44, 51/48, 37/28
U.S. Cl. 260—525 **8 Claims**

1. A process for the isolation of 2-hydroxynaphthalenecarboxylic acid from its reaction mixture derived from the reaction of the alkali metal salts of 2-hydroxynaphthalene with carbon dioxide which comprises diluting the reaction mixture with such an amount of water that the ratio of water to organic product is about 4:1 to 6:1, maintaining the reaction mixture at a temperature of about 80° to 100° C, adjusting the pH to about 6 to 7 by addition of aqueous mineral acid, adding, if required, such an amount of 2-hydroxynaphthalene that 1 mole or more of 2-hydroxynaphthalene is present per mole of 2-hydroxynaphthalenecarboxylic acid, allowing the phases to separate into an upper and lower phase, separating the lower phase at a temperature of about 80° to 100° C, cooling said upper phase to a temperature of about 15° to 25° C to precipitate 2-hydroxynaphthalene, separating the precipitate, adjusting the pH of the remaining liquid upper phase to about 1 to 2 and isolating the 2-hydroxynaphthalenecarboxylic acid that has separated.

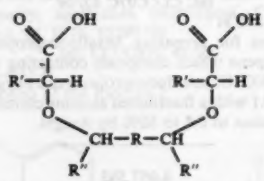
4,057,577

PROCESS FOR PREPARING DI(ALKOXY-CARBOXY) HYDROCARBYLENES

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 5, 1976, Ser. No. 711,934
Int. Cl.² C07C 59/22
U.S. Cl. 260—535 P **11 Claims**

1. A process for preparing di(alkoxycarboxy) compounds of the formula



wherein R is straight or branched chain alkylene, oxaalkylene or cycloalkylene; each R' is hydrogen or straight or branched chain alkyl; and each R'' is hydrogen, straight or branched alkyl, arylalkyl, haloalkyl or oxaalkyl, which comprises contacting carbon monoxide with a saturated aldehyde and a non-adjacent dihydric alcohol in the presence of a catalytic amount of hydrogen fluoride at a temperature of from about 0° to about 100° C and a carbon monoxide partial pressure of from about 10 psia to about 4000 psia.

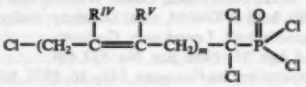
4,057,578

ADDUCTS OF OLEFINS AND TRICHLOROMETHANE PHOSPHONIC DICHLORIDE

Meir Asscher, and Hadassa Rosin, both of Rehovot, Israel, assignors to Rhone-Progil, Paris, France

Division of Ser. No. 529,556, Dec. 4, 1974, which is a continuation of Ser. No. 235,384, March 16, 1972, abandoned. This application Apr. 12, 1976, Ser. No. 675,937
Claims priority, application Israel, Mar. 17, 1971, 36431
Int. Cl.² C07F 9/34
U.S. Cl. 260—543 P **9 Claims**

1. Adducts of trichloromethane phosphonic dichloride and olefinically unsaturated compounds having the general formula:



wherein R^{IV} and R^{V} are each selected from the group consisting of hydrogen, methyl and chlorine, and m is an integer from 1 to about 200.

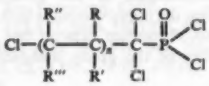
4,057,579

ADDUCTS OF OLEFINS AND TRICHLOROMETHANE PHOSPHONIC DICHLORIDE

Meir Asscher, and Hadassa Rosin, both of Rehovot, Israel, assignors to Rhone-Progil, Paris, France

Continuation of Ser. No. 235,384, March 16, 1972, abandoned. This application Dec. 4, 1974, Ser. No. 529,556
Claims priority, application Israel, Mar. 17, 1971, 36431
Int. Cl.² C07F 9/34
U.S. Cl. 260—543 P **19 Claims**

1. Compounds having the general formula



wherein R and R' may be the same or different and are each selected from the group consisting of hydrogen, C_1 to C_6 alkyl and fluorine; R'' is selected from the group consisting of hydrogen, C_1 to C_{12} alkyl, fluorine, bromine, chlorine, phenyl and substituted phenyl in which the substituent is selected from the group consisting of chlorine, a vinyl group, nitro and carboxy; R''' is selected from the group consisting of hydrogen, C_1 to C_6, alkyl fluorine, chlorine, bromine, or R and R'' together define a ring selected from the group consisting of a cyclohexane ring, a cyclooctane ring, a norbornane ring, a norbornanone ring, a 2,6,6-trimethylbicyclo[3.1.1]heptane ring and a succinic anhydride ring; and *n* is an integer from 1 to about 500.

4,057,580

PRODUCTION OF WATER-SOLUBLE POLYAMINE CONDENSATE POLYMERS HAVING GREATER LINEAR CHARACTERISTICS

Kenneth G. Phillips, River Forest; Edward G. Ballweber, Glenwood, and Radhakrishnan Selvarajan, Oak Park, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed July 27, 1976, Ser. No. 709,029
Int. Cl.² C07C 85/04
U.S. Cl. 260—567.6 P **5 Claims**

1. In a process for the production of water-soluble polyamine polymers by condensation reaction from ethylene dichloride and ammonia under pressure of 4–10 atmospheres, the

improvement which comprises conducting the reaction in two stages and

1. reacting ethylene dichloride and ammonia at a temperature of about 110–120° C and at pH of 9.0–10.0 for 1–3 hours in the presence of a first amount of alkali metal hydroxide to produce a polyamine reaction mixture; and
2. thereafter adding to said polyamine reaction mixture a second equal amount of alkali metal hydroxide wherein the total of the first and second amounts is equivalent to about 150% based on the equivalent weight of the available chlorine present and continuing heating the reaction mixture for about 8–12 hours at about 102°–112° C to produce a polyamine condensate polymer product of increased linear characteristics.

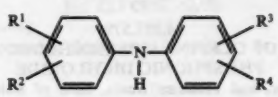
4,057,581

PROCESS FOR PREPARING DIPHENYLAMINES

Hermann-Dieter Krall, Meerbusch; Oskar Weissel, and Hans-Helmut Schwarz, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 15, 1976, Ser. No. 677,478
Claims priority, application Germany, May 10, 1975, 2520893
Int. Cl.² C07C *87/54, 91/16, 91/18*
U.S. Cl. 260—571 **18 Claims**

1. In a process for preparing a diphenylamine having the formula



wherein

R^1, R^2, R^3 and R^4 are the same or different and are hydrogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms

by catalytic dehydrogenation of a dicyclohexylamine, N-cyclohexylidene-cyclohexylamine, N-cyclohexyl-aniline or N-cyclohexylidene-aniline in the presence of a nickel/-chromium catalyst the improvement which comprises employing as the nickel/chromium catalyst one which contains at least one member of the group manganese, aluminum and copper.

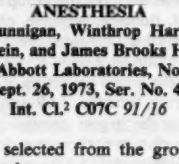
4,057,582

AMINOTETRALINS AND USE IN INDUCING ANESTHESIA

Daniel Ambrose Dunnigan, Winthrop Harbor; Adolph Oscar Geiszler, Mundelein, and James Brooks Holland, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sept. 26, 1973, Ser. No. 401,018
Int. Cl.² C07C *91/16*
U.S. Cl. 260—574 **2 Claims**

1. A compound selected from the group consisting of a member of the formula



where R_1 is selected from the group consisting of a branched or straight chain alkyl of 6–9 carbon atoms and cyclohexyl, R_2 is selected from the group consisting of hydrogen, loweralkyl and lower alkanol, wherein said R_2 contains 1–3 carbon atoms, and R_3 is 5-methoxy or 6-methoxy; and nontoxic pharmaceutically acceptable acid addition salts thereof.

4,057,583

PROCESS FOR THE PREPARATION OF PINACOLONE

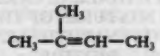
Walter Merz, Leverkusen, and Dieter Nachtsheim, Dormagen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 15, 1975, Ser. No. 640,801
Claims priority, application Germany, Dec. 27, 1974, 2461503
Int. Cl.² C07C *45/02*
U.S. Cl. 260—593 R **16 Claims**

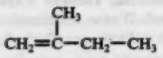
1. Process for the preparation of pinacolone which process comprises

1. mixing a butene compound selected from

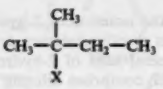
a. 2-methyl-but-2-ene of the formula



b. 2-methyl-but-1-ene of the formula



c. the addition products of the two said butenes of the general formula



in which

X is Cl, Br, HSO_4 or H_2PO_4,

and mixtures of said compounds with an aqueous solution of hydrochloric or hydrobromic acid to provide 15% to 40% by weight of said acid in the aqueous phase of the resulting mixture;

2. adding formaldehyde to the resulting mixture over a period of 0.5 to 10 hours, at a pressure of from 1 to 20 bars (absolute) and at a temperature of from 50° to 200° C. at a rate of 0.5 to 1.5 moles of formaldehyde per mole of butene compound,
3. allowing the mixture to react for an additional period of 0.5 to 3 hours; and
4. separating off the pinacolone by distillation.

4,057,584

PROCESS FOR PREPARING HEXAFLUOROPROPANONE-2

Takashi Touzuka, Settsu, and Yonosuke Ohsaka, Takatsuki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed June 11, 1976, Ser. No. 695,110
Claims priority, application Japan, June 24, 1975, 50-79021
Int. Cl.² C07C *45/04*
U.S. Cl. 260—593 H **2 Claims**

1. A process for preparing hexafluoropropanone-2 from hexafluoropropene which comprises contacting at a temperature of 80° to 300° C. hexafluoropropene and oxygen in a molar ratio of 1:10–0.1 with a fluorinated alumina containing fluorine in a concentration of 0.5 to 50% by weight.

4,057,585

METHOD OF PREPARING 2,3-DICHLOROANISOLE

Wilford Lee Mendelson, Philadelphia, and Robert Lee Webb, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Sept. 2, 1976, Ser. No. 719,795
Int. Cl.² C07C *41/04*
U.S. Cl. 260—612 D **8 Claims**

1. The method of preparing 2,3-dichloro-1-loweralkoxyben-

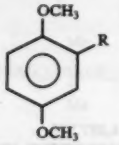
zenes comprising the reaction of 1,2,3-trichlorobenzene with an alkali metal lower alkoxide with heating at about 100°–200° C. for from about ½–24 hours in an inert organic solvent selected from the group consisting of dimethylformamide, dimethyl acetamide and dimethylsulfoxide and additionally in the presence of an alkanol selected from the group consisting of methanol and ethanol and said alkanol is present in the reaction mixture in a quantity sufficient to solvate the metal lower alkoxide reagent.

4,057,586
PROCESS FOR THE MANUFACTURE OF HYDROQUINONE DIMETHYL ETHERS

Rudolf Pistorius, Wehrheim, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

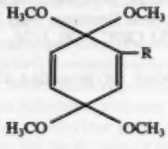
Filed Oct. 21, 1976, Ser. No. 734,455
Claims priority, application Germany, Oct. 23, 1975, 2547464
Int. Cl.² C07C *41/00*
U.S. Cl. 260—613 D **7 Claims**

1. Process for the manufacture of hydroquinone dimethyl ethers of the formula



I,

wherein R is hydrogen, an alkyl group having from 1 to 4 carbon atoms or hydrogen, which comprises hydrogenating catalytically p-benzoquinone tetramethyl diketals of the formula



II,

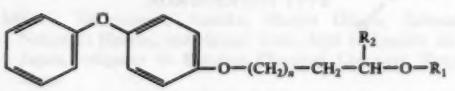
wherein R has the same meaning as in formula I, in the presence of a noble metal catalyst at a temperature from about 0° to +150° C.

4,057,587
DIPHENYL ETHER DERIVATIVES

Friedrich Karrer, Basel, and Saleem Farooq, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,877
Claims priority, application Switzerland, Oct. 24, 1974, 14247/74; Sept. 18, 1975, 12297/75
Int. Cl.² C07C *43/22*
U.S. Cl. 260—613 R **7 Claims**

1. A compound of the formula I



(I)

wherein

R_1 represents a C_3–C_5-alkenyl, C_3–C_5-halogenoalkenyl or C_3–C_5-alkynyl radical,

R_2 represents a hydrogen atom or a methyl radical, and

n represents the number 1 or 2.

4,057,588
PROCESS FOR THE PREPARATION OF PHLOROGLUCINOL

Hans-Georg Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, Main, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jan. 21, 1976, Ser. No. 651,089
Claims priority, application Germany, Jan. 22, 1975, 2502429
Int. Cl.² C07C *39/10*
U.S. Cl. 260—621 R **8 Claims**

1. A process for the preparation of phloroglucinol from benzene-tricarboxylic acid — (1,3,5) — triamide comprising the steps of:

a. utilizing chlorine to chlorinate benzene — tricarboxylic acid — (1,3,5) — triamide in an aqueous inorganic acid medium selected from the group consisting of aqueous hydrochloric acid, aqueous sulfuric acid, and aqueous phosphoric acid, an aqueous alcoholic medium, or a mixture thereof, at a temperature from about 0° to about 40° C, to form benzene — tricarboxylic acid(1,3,5) — tri-N-chloramide;

b. reacting an aqueous suspension of said tri-N-chloramide with ammonia at a temperature not exceeding 25° C until said tri-N-chloramide has dissolved and subsequently heating the reaction mixture to boiling to form 1,3,5-triureido-benzene; and

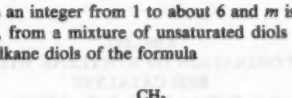
c. hydrolyzing said 1,3,5-triureido-benzene in an inorganic acid solution selected from the group consisting of hydrochloric acid solution and sulfuric acid solution at a temperature from about 140° to about 200° C and corresponding characteristic partial pressure to form phloroglucinol.

4,057,589
HYDROXYLATION OF UNSATURATED DIOLS TO PREPARE NOVEL TETRAOLS

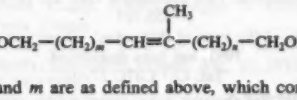
Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 612,417, Sept. 11, 1975, Pat. No. 3,991,126.
This application June 18, 1976, Ser. No. 697,594
Int. Cl.² C07C *29/02, 29/10*
U.S. Cl. 260—635 E **3 Claims**

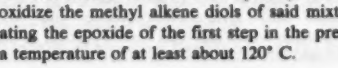
1. A process for preparing tetraols of the formula



wherein n is an integer from 1 to about 6 and m is an integer from 0 to 6, from a mixture of unsaturated diols comprising methylene alkane diols of the formula



and methyl alkene diols of the formula



wherein n and m are as defined above, which comprises the steps of: (1) contacting said mixture of unsaturated diols with less than the stoichiometric amount of a peroxy acid to selectively epoxidize the methyl alkene diols of said mixture; and hydroxylating the epoxide of the first step in the presence of water at a temperature of at least about 120° C.

4,057,590

PROCESS FOR MAKING PENTACHLORONITROBENZENE

Walter A. Gay, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 24, 1977, Ser. No. 761,565
Int. Cl.[2] C07C 79/12
U.S. Cl. 260—646 13 Claims

1. The process for producing pentachloronitrobenzene comprising

reacting pentachlorobenzene with substantially pure nitric acid at a temperature from about 40° to about 85° C, with the provisos that

i. a weight ratio of said nitric acid to said pentachlorobenzene of at least about 3.0:1 is employed when the reaction is effected at a temperature in the range of about 40° to about 49° C;

ii. a weight ratio of said nitric acid to said pentachlorobenzene of at least about 2.5:1 is employed when the reaction is effected at a temperature in the range of about 50° to about 59° C;

iii. a weight ratio of said nitric acid to said pentachlorobenzene of at least about 2.0:1 is employed when the reaction is effected at a temperature in the range of about 60° to about 75° C; and

iv. a weight ratio of said nitric acid to said pentachlorobenzene in the range of about 2.0:1 to 3.5:1 is employed when the reaction is effected at a temperature in the range of about 76° to about 85° C.

4,057,591

PROCESS FOR PREPARING OLIGOMERS OF TETRAFLUOROETHYLENE

Masahiro Ozawa; Fumio Inoue, both of Kamifukuoka; Tadaaki Komatsu, Saitama, and Kimiaki Matsuoka, Kawagoe, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed June 16, 1976, Ser. No. 696,718
Claims priority, application Japan, June 16, 1975, 50-72054
Int. Cl.[2] C07C 21/18; C08F 2/38; C07C 17/26
U.S. Cl. 260—653.1 R 19 Claims

1. A process for preparing oligomers of tetrafluoroethylene comprising subjecting tetrafluoroethylene monomer to an oligomerization reaction in the presence of a fluoride compound selected from the group consisting of potassium fluoride, sodium fluoride, cesium fluoride, ammonium fluoride, and a quaternary ammonium fluoride and a crown ether, at a temperature of about from 20° to 200° C, said oligomerization reaction being carried out in an organic solvent which is inert under said reaction conditions, said fluoride compound being employed in an amount greater than 0.01 mol per liter of said solvent and said crown ether being employed in an amount greater than 1/50 mol of the employed fluoride compound.

4,057,592

OXYCHLORINATION OF ETHYLENE WITH FLUID BED CATALYST

Albert Antonini; Philippe Joffre, both of Paris, and Francois Laine, Martiques, all of France, assignors to Rhone-Poulenc Industries, France

Continuation of Ser. No. 144,652, May 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 730,605, May 20, 1968, abandoned. This application Dec. 23, 1974, Ser. No. 535,797
The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.
Int. Cl.[2] C07C 17/02
U.S. Cl. 260—659 A 17 Claims

1. A process for the oxychlorination of ethylene to produce a product in which at least 15 mole percent of the ethylene is transformed into 1,1,2-trichloroethane and 1,1,2,2-tetrachloroethane, in which less than 5 mole percent of the ethylene is transformed into combustion products and in which less than 3 mole percent of the ethylene is transformed to unsaturated C_2 chlorinated compounds, comprising passing a gaseous feed mixture of ethylene, hydrogen chloride and an oxygen containing gas through a reaction zone maintained at a temperature within the range of 280° to 370° C and containing a fluid bed catalyst comprising an oxychlorination catalyst deposited on a carrier consisting essentially of silica and magnesia having a surface area within the range of 10 to 200 m^2/g, in which the molar feed ratios of the reactants are a ratio of O_2/C_2H_4 within the range of above 0.9 to 1.5, a ratio of HCl/O_2 within the range of 1.40 to 3.0 and a ratio of HCl/C_2H_4 within the range of 2.20 to 3.65.

4,057,593

PROCESS FOR PREPARING CIS-OLEFINS

Hans Jürgen Bestmann, Erlangen; Werner Theo Stransky, and Otto Vostrowsky, both of Uttenreuth, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 521,170, Nov. 5, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,417
Claims priority, application Germany, Nov. 7, 1973, 2355534
Int. Cl.[2] C07C 1/00, 1/24
U.S. Cl. 260—682 18 Claims

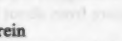
1. An improved process for preparing cis-olefins of the formula

III

wherein

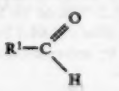
R is straight-chain or branched (C_1–C_{15}) alkyl or (C_2–C_{15}) alkenyl and

R^1 is a straight-chain or branched (C_1–C_{20}) alkyl or (C_2–C_{20}) alkenyl group, which process comprises dissolving potassium in a hexaalkylphosphoric acid triamide, adding to the solution obtained a phosphonium salt of the formula



I

and adding to the reaction mixture obtained an aldehyde of the formula



II

and isolating the product obtained.

4,057,594

Patent Not Issued For This Number

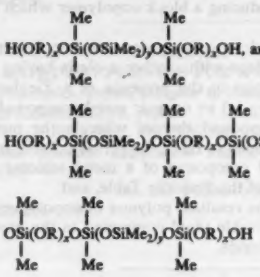
4,057,595

METHOD OF MODIFYING THE PHYSICAL PROPERTIES OF URETHANE ELASTOMERS

Lawrence A. Rauner, and Joseph A. Colquhoun, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 19, 1975, Ser. No. 578,562
Int. Cl.[2] C08L 83/06
U.S. Cl. 260—824 R 14 Claims

1. A method of modifying the physical properties of urethane elastomers which method consists of (I) introducing into an uncured urethane elastomer from 5.1 to 36 weight percent, based on the weight of the urethane and siloxane-polyoxyalkylene copolymer, a siloxane-polyoxyalkylene copolymer selected from the group consisting of



(A)

(B)

wherein each x has an average value of 3 to 45, each y has an average value of 8 to 198, Me is a methyl radical, wherein $-(OR)_x-$ is a polyoxyalkylene polymer or copolymer wherein R is composed of ethylene radicals or butylene radicals and mixtures of ethylene or butylene radicals with propylene radicals, the amount of ethylene or butylene radicals relative to the propylene radicals being such that the ratio of carbon atoms to oxygen atoms in the total $-(OR)-$ block ranges from 2.0/1 to 2.9/1, which siloxane-polyoxyalkylene copolymer is prepared by the process which consists essentially of reacting a dihydroxy functional linear dimethylpolysiloxane with a dihydroxy functional polyoxyalkylene polymer, wherein the hydroxy groups on the polyoxyalkylene polymer are primary hydroxyl groups and where the mole ratio of the hydroxy on the polyoxyalkylene polymer to the hydroxy on the linear dimethylpolysiloxane is 2:1 to 0.5:1, in a solvent solution at 40–75 percent solids based on the total weight of the dimethylpolysiloxane, polyoxyalkylene polymer and solvent, in the presence of a non-rearranging acid condensation catalyst at a temperature of 80°–130° C. for a period of 3–15 hours,

(II) curing the urethane polymer whereby the siloxane polyoxyalkylene copolymer is reacted into the urethane polymer, thereby modifying the physical properties of the urethane polymer.

4,057,596

ANTI-STICKING SILICONE COMPOSITIONS OF NON-SOLVENT TYPE

Minoru Takamizawa, Annaka; Humio Okada, Takasaki; Nobuyuki Hasebe, and Hiromi Toida, both of Annaka, all of Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed June 6, 1974, Ser. No. 476,989
Claims priority, application Japan, June 11, 1973, 48-65580
Int. Cl.[2] C08L 83/06, 83/14
U.S. Cl. 260—825 5 Claims

1. An anti-sticking, non-solvent type silicone composition which comprises

a. a diorganopolysiloxane of substantially straightchain molecular structure having vinylmethylsilyl terminal groups at both chain ends, more than 90% of the organic groups bonded to the silicon atoms other than the terminal silicon atoms therein being methyl groups and the remaining organic groups being monovalent organic groups having no aliphatic unsaturation, and having a viscosity within the range between 30 centistokes and 5,000 centistokes at 25° C,

b. a diorganopolysiloxane of substantially straightchain molecular structure having hydrogendimethylsilyl terminal groups at both chain ends, more than 90% of the organic bonded to the silicon atoms other than the terminal silicon atoms therein being methyl groups and the remaining organic groups being monovalent organic groups having no aliphatic unsaturation, and having a viscosity within the range between 2 centistokes and 100 centistokes at 25° C,

c. a methylvinylpolysiloxane having at least three vinyl groups bonded directly to the silicon atoms in one molecule, and having a viscosity within the range between 10 centistokes to gum-like consistency at 25° C,

d. a methylhydrogenpolysiloxane having at least three hydrogen atoms bonded directly to the silicon atoms in one molecule, and having a viscosity within the range between 10 centistokes and 500 centistokes at 25° C, and

e. a catalyst capable of accelerating addition reaction between the vinyl groups bonded directly to the silicon atoms and the hydrogen atoms bonded directly to the silicon atoms;

said anti-sticking composition having a viscosity within the range between 30 centistokes and 10,000 centistokes at 25° C, and wherein the molar ratio of the hydrogen atoms bonded directly to the silicon atoms in said component (b) to the vinyl bonded directly to the silicon atoms in said component (a) is within the range between 0.1 and 1.0; the molar ratio of the hydrogen atoms bonded directly to the silicon atoms in said components (b) and (d) to the vinyl groups bonded directly to the silicon atoms in said components (a) and (c) is within the range between 0.5 and 5.0; and the total amount of said components (a) and (b) is from 30 to 95% by weight based on the weight of the composition.

4,057,597

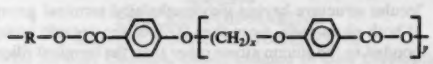
BLOCK-TYPE ARYL COPOLYESTERS AND FILAMENTS BASED ON THESE COPOLYESTERS

Bernard Fayolle, Ecully, France, assignor to Rhone-Poulenc-Textile, Paris, France

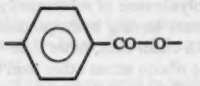
Filed Aug. 25, 1976, Ser. No. 717,677
Claims priority, application France, Aug. 27, 1975, 75.26737; June 8, 1976, 76.17484
Int. Cl.[2] C08L 67/00; B28B 3/20; D01D 5/12; D01F 11/00
U.S. Cl. 260—860 8 Claims

1. Spinnable and moldable block-type copolyesters, characterized in that they consist essentially of:

from 10 to 90% of recurring flexible units of the formula



in which R is an aliphatic, alicyclic or araliphatic radical, x is an integer from 2 to 6, inclusive, and y is 0 or 1, and from 90 to 10% of recurring rigid units of the formula



the copolyesters having an inherent viscosity of at least 0.25, measured on an 0.5% strength by weight solution in a 60/40 mixture of phenol and tetrachloroethane at 25° C.

4,057,598

MULTIPHASE BLOCK AND GRAFT COPOLYMERS COMPRISING A HYDROPHILIC CONTINUOUS PHASE AND HYDROPHOBIC DOMAINS

Robert D. Lundberg, Somerville, and Neville G. Thame, Edison, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 327,831, Jan. 29, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,613

Int. Cl.² C08L *53/00*

U.S. Cl. 260—857 G **6 Claims**

1. A composition of matter which comprises a thermoplastic having an average molecular weight of at least 10,000 selected from the group consisting of copolymers represented by graft copolymers having the general formula

and block copolymers having the general formula xB—[AB]$_n$—ya wherein n is an integer ≥ 1, m is >1, x and y are 0 or 1, and y is 1 when n is 1, A is a thermoplastic hydrophobic polymer block having a softening point of at least about 35° C. and a molecular weight of at least about 2,00, A being selected from the group consisting of polystyrene, poly(t-butyl styrene), polyvinyl toluene, polymethylmethacrylate, polyamides and copolymers thereof, and B is a thermoplastic hydrophilic polymer block which comprises from about 30–97 weight % of said copolymer, B being selected from the group consisting of poly(ethylene oxide), polyacrylamide, poly- α-hydroxyethylmethacrylate and copolymers thereof wherein the hydrophilic portion is greater than 50%, and said composition further characterized as being a water swollen gel.

4,057,599

PROCESS FOR THE PREPARATION OF VINYL AROMATIC-MODIFIED POLYPHENYLENE ETHERS

Glenn Dale Cooper, Delmar, and Irwin Schraga, Guilderland, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 18, 1976, Ser. No. 733,519

Int. Cl.² C08L *23/00, 25/00*

U.S. Cl. 260—874 **10 Claims**

1. In a process for the preparation of a composition comprising a polyphenylene ether resin and a vinyl aromatic resin which comprises heating a mixture comprising a polyphenylene ether resin and a vinyl aromatic compound under polymerization conditions until the vinyl aromatic compound has at least partially polymerized the improvement which comprises forming said mixture from (i) a polyphenylene ethermethylene chloride complex obtained by oxidinzing a phenol in a warm solution of methylene chloride in the presence of a complex catalyst, extracting the catalyst and cooling in precipitate the complex and (ii) said vinyl aromatic compound, heating said mixture to decompose said complex and to remove the methylene chloride from the mixture, and thereafter continuing said heating until the vinyl aromatic compound has at least partially polymerized.

4,057,600

PROCESS FOR PRODUCING BLOCK COPOLYMERS

Akio Kimura; Kenji Seki; Mamoru Ukita; Satoshi Asahi, all of Sodegaura, and Sanae Tagami, Ichihara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 747,937

Claims priority, application Japan, Dec. 16, 1975, 50-149097

Int. Cl.² C08F *295/00*

U.S. Cl. 260—878 B **19 Claims**

1. A process for producing a block copolymer which comprises

i. polymerizing ethylene or propylene or copolymerizing ethylene or propylene with another α-olefin having from 2 to 7 carbon atoms in the presence of a Ziegler-type catalyst comprising (a) an organic metal compound or a hydrogenated compound thereof wherein the metal is selected from groups I to III of the Periodic Table and (b) a transition metal compound of a metal selected from groups IV to VI of the Periodic Table, and

ii. copolymerizing the resultant polymer or copolymer with a radical-polymerizable vinyl compound in the presence of an organic sulfoxide.

4,057,601

BLOCK COPOLYMERS OF ALKADIENES AND MONOVINYL ARENES

George A. Moczygemba, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 20, 1975, Ser. No. 633,884

Int. Cl.² C08L *53/02*

U.S. Cl. 260—880 B **9 Claims**

1. A copolymer having the structure D-E-C, wherein D is a hydrogenated block of low vinyl poly-1,3-butadiene, E is a hydrogenated polyisoprene block, and C is a polystyrene block.

4,057,602

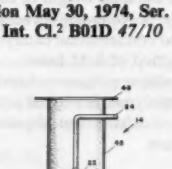
VENTURI SCRUBBER

Ernest L. Kolm, 419 W. Cambridge, Alliance, Ohio 44601

Continuation of Ser. No. 233,091, March 9, 1972, abandoned. This application May 30, 1974, Ser. No. 474,701

Int. Cl.² B01D *47/10*

U.S. Cl. 261—63 **17 Claims**



1. In a venturi scrubber having a first region for receiving a primary stream of gas, a second region extending from the downstream end of the first region and converging in the downstream direction, a third region of reduced diameter extending in a smooth inner surface configuration at the downstream end of the second region and forming the venturi

throat, and a fourth region extending in a smooth inner surface configuration from the downstream end of the third region and diverging in the downstream direction, means to inject liquid in droplet form into the primary stream of gas, the improvement which comprises:

at least one first duct opening into the scrubber at a point located within a first zone encompassing the downstream portion of the third region and the upstream portion of the fourth region; and

means for directing a secondary stream of gas through the first duct into the first zone of the scrubber whereby the gas enters the first zone at an acute angle to the primary stream of gas so as to cause a substantial increase in turbulence within the primary stream of gas and a resultant increase in the surface area of the liquid droplets in said stream.

4,057,603

SAFETY APPARATUS FOR A CARBURETOR

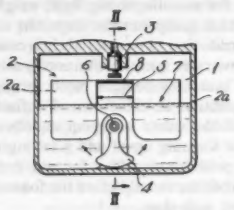
Gen Irie, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1976, Ser. No. 668,789

Claims priority, application Japan, Mar. 24, 1975, 50-38406[U]

Int. Cl.² F02M 5/02

U.S. Cl. 261—70 **1 Claim**



1. Safety apparatus for a carburetor comprising a float chamber adapted for containing fuel therein, said float chamber having opposite end walls, a float, a first shaft mounted proximate one of said end walls pivotably supporting said float in said chamber to follow the level of the fuel therein, a fuel valve disposed above said float for being closed thereby upon upward movement of the float, a pendulum weight, a second shaft mounted at the other end wall and pivotably supporting said pendulum weight in said chamber beneath said float for applying force to said float to close said fuel valve upon inclination of said chamber, said second shaft being positioned substantially midway of the width of said float, said shafts extending at right angles to one another, said pendulum having an upper end pivotably mounted on said shaft, said float including two spaced sections between which said pendulum is pivotably supported on said second shaft and an arm connected to said sections, said pendulum weight being a flat member having a narrow upper portion and a widened lower portion, said lower portion having opposite ends each positioned for contacting a respective float section depending on the direction of inclination of the chamber.

4,057,604

EXHAUST POLLUTION REDUCTION APPARATUS FOR INTERNAL COMBUSTION ENGINE CARBURETOR

Eugene C. Rollins, 3515 Fowler Ave., Ogden, Utah 84403

Filed Apr. 8, 1976, Ser. No. 674,853

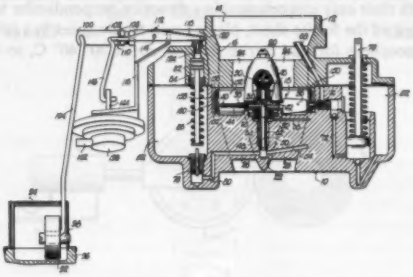
Int. Cl.² F02M 17/16

U.S. Cl. 261—88 **6 Claims**

1. In a carburetor for use with an internal combustion engine, said carburetor having an air horn defining a central bore, an air rotor rotatable within said bore in response to ambient air drawn into and through the bore during engine operation, at least one liquid fuel discharge jet on the rotor and rotatable therewith, and means for supplying the jet with liquid fuel during said rotation of the rotor, the improvement comprising:

said jet being positioned to direct a stream of fuel forwardly with respect to the direction of rotation of the rotor and therefore against the force of air within the bore,

said jet being disposed in close proximity to the periphery of the bore,



said jet also being directed at least partially radially inwardly toward the axis of rotation of the rotor,

said jet also being directed at least partially in counterflow relationship to the normal direction of travel of air through the horn.

4,057,605

MANUFACTURE OF LIGHT GRANULAR MATERIALS

Raymond Chauvin, Verneuil-en-Halatte, France, assignor to Charbonnages de France, Paris, France

Continuation of Ser. No. 433,617, Jan. 15, 1974, abandoned. This application Dec. 4, 1975, Ser. No. 637,648

Claims priority, application Luxembourg, Jan. 19, 1973, 66860

Int. Cl.² B01J 2/04

U.S. Cl. 264—13 **11 Claims**

1. A method of manufacturing porous granular material useful as lightweight aggregate for concrete, and obtained from silico-aluminous material, comprising:

a. crushing the silico-aluminous material to a powder having a particle size of less than about 200 microns,

b. mixing said powder with water to form a slip which can be divided into droplets, said slip containing 25–40% by weight of water,

c. forming said slip into droplets which fall into a fluidized bed of solid particles, said bed being maintained at a temperature of 200°–500° C,

d. evaporating the water from said droplets in said bed to convert said droplets to expanded granules,

e. recovering said expanded granules, and

f. subjecting said expanded granules to ceramic firing.

4,057,606

METHOD OF PRODUCING ANISOTROPIC FERRITE MAGNET

Seihin Kobayashi, Kosai; Michihiro Torii, Hamamatsu, and Hiroaki Kobayashi, Toyohashi, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 429,739, Jan. 2, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,681

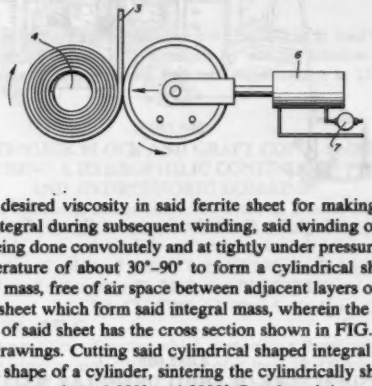
Claims priority, application Japan, July 14, 1972, 47-70010; July 14, 1972, 47-70011

Int. Cl.² B06B 1/02

U.S. Cl. 264—24 **9 Claims**

1. A method of producing an anisotropic ferrite magnet having a radial particle orientation comprising mixing pulverized ferrite particles with an organic binder suitable for forming ferrite magnets to develop the particles in the planar direc-

tion perpendicular to the C-axis, said pulverized ferrite particles having a hexagonal crystal structure of the magnetoplumbite type and comprising a substance having the chemical composition $MO:6Fe_2O_3$ in which M is Ba, Sr or Pb, said pulverized ferrite having been calcined and having a well-advanced crystal growth, rolling said mixture between calender rollers to form a ferrite sheet, said calender rollers being driven at substantially the same speed to align the particles with their easy axis oriented in a direction perpendicular to the plane of the ferrite sheet, placing said ferrite sheet in a solvent atmosphere for said ferrite sheet at about 30° 40° C, so as to



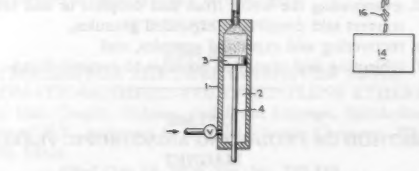
yield a desired viscosity in said ferrite sheet for making said sheet integral during subsequent winding, said winding of said sheet being done convolutely and at tightly under pressure and a temperature of about 30°–90° to form a cylindrical shaped integral mass, free of air space between adjacent layers of said wound sheet which form said integral mass, wherein the starting end of said sheet has the cross section shown in FIG. 1 (c) of the drawings. Cutting said cylindrical shaped integral mass into the shape of a cylinder, sintering the cylindrically shaped ferrite mass at about 1,000° to 1,3000° C and applying a magnetic field to said sintered mass to complete said anisotropic ferrite magnet having said radial particle orientation.

4,057,607

PROCESS FOR PREPARING SHEAR DEGRADABLE PARTICLE-CONTAINING RESIN POWDERS

John W. Soehngen, Berkeley Heights, and Martin J. Hannon, Martinsville, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,415
Int. Cl.² C08K 3/08
U.S. Cl. 264—28 **15 Claims**



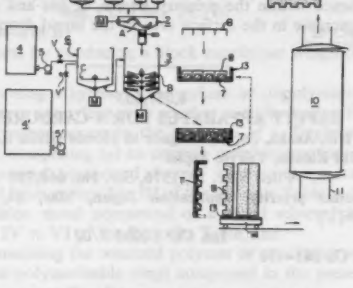
1. An improved process for preparing shear degradable particle-containing resin powders which process comprises (a) preparing a first composition consisting essentially of shear degradable particles and molten resin in the absence of high shearing forces on the particles, (b) intimately blending said first composition with a second composition consisting essentially of molten resin and curing agent to form a shear degradable particle-containing molten resin mixture in the absence of high shearing forces on the shear degradable particles and without activating the curing agent, (c) solidifying the shear degradable particle-containing molten resin mixture, and (d) grinding the solidified mixture to desired particle size.

4,057,608

PROCESS OF CONTINUOUS MANUFACTURE OF LIGHT-WEIGHT FOAMED CONCRETE

Akihiro Hashimoto, Atsugi; Shigeo Hayashi; Sadao Yamamoto, both of Yokohama, and Hitoshi Chujo, Tokyo, all of Japan, assignors to Showa Denko Kabushiki Kaisha and Misawa Homes Institute of Research and Development, both of Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 678,375
Int. Cl.² B29H 7/20
U.S. Cl. 264—42 **8 Claims**



1. A process for manufacturing light-weight foamed concrete articles which comprises the steps of:

separately introducing two materials in a continuous manner at stated flow rates into a continuously stirred vessel, one of the two materials being a rapid setting hydraulic cement composition in the form of a finely divided dry powder and the other being an aqueous foamed liquid containing a foaming agent and a setting retarder;

continuously withdrawing the foamed cement slurry, so prepared, from the vessel before the foamed cement slurry begins to set, and; then,

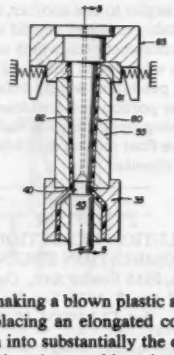
placing the foamed slurry in a mold thereby to be cast therein.

4,057,609

METHOD OF MAKING BLOWN PLASTIC ARTICLES

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 500,679, Aug. 26, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,673
Int. Cl.² B29C 17/07
U.S. Cl. 264—89 **8 Claims**



1. In a method of making a blown plastic article, the steps of (1) downwardly displacing an elongated core pin for axially inserting the core pin into substantially the entire length of an elongated open ended parison mold cavity which is substantially the same length as the core pin but slightly longer, the core pin having a frusto-conical recess in its end, (2) as the core pin approaches the distal end of the mold cavity, abutting the cantilevered end of the core pin against the free end of an

axially movable, essentially cylindrical, biased support which is concentric with the core pin and projects into the mold cavity, the support including a frusto-conical projection which is telescopically received within the core pin recess and centers the core pin in the mold cavity through engagement of tapered surfaces of the projection and recess, with said free end of the core pin and the cylindrical portion of the support being of substantially the same external diameter at their abutting ends, with the abuttment of these members forming an essentially tubular cavity end portion having essentially the same inner diameter as the cavity portion immediately adjacent said end portion, and said support having an enlarged portion closing the adjacent end of the cavity, (3) jointly and axially displacing the core pin, the support, and the enlarged portion downwardly against the biasing force of the support (a) to guide the core pin during the final phases of the movement thereof into the mold cavity, (b) to remove the enlarged portion of the support from the cavity and (c) to expose the cavity to a source of plastic material in order to fill the cavity with plasticized plastic material under pressure introduced through an annular orifice surrounding the free end of said support to form an essentially tubular parison having an open end, (4) stripping the parison while supported on the pin from the mold cavity by vertically raising the core pin, with a minor terminal tubular portion of the parison projecting beyond the core pin, said terminal tubular portion having a thickness substantially the same as that portion of the parison adjacent the cantilevered end of the core pin, (5) displacing the parison on the core pin along an arcuate path to a blow molding station, (6) vertically lowering the core pin and parison to a position between a pair of blow mold sections (7) closing the mold sections and thereby pinching shut the projecting end of the parison, (8) blow molding the parison at said blow molding station to form a blown article, (9) stripping the blown article from the blow pin by vertically raising the blow pin relative to the blown article, and (10) displacing the blow pin along an arcuate path back to a position in vertical alignment with the parison mold.

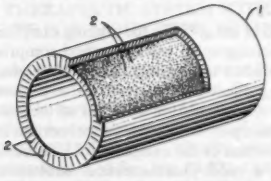
4,057,610
HOSE REINFORCED WITH DISCONTINUOUS FIBERS ORIENTED IN THE RADIAL DIRECTION

Lloyd Arnold Goettler, and Arthur James Lambright, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed July 25, 1975, Ser. No. 599,115

Int. Cl.[2] B29D *3/02*; B29F *3/04*

U.S. Cl. 264—108 **35 Claims**



1. A process for preparing hose of extrudable polymer reinforced with discontinuous fibers which comprises extruding composite comprising extrudable polymer and 5-200 parts by weight discontinuous fibers per 100 parts by weight matrix through a die having a channel of curvilinear cross-section formed between surfaces of a central mandrel and an outer die member in which (Ao/Ai) is about two or more and (Wo/Wi) + (Ro/Ri) is two or more wherein Ao is the channel outlet area, Ai is the channel inlet area, Wo is the channel width at the outlet, Wi is the channel width at the inlet, Ro is the channel outlet main radius, and Ri is the channel inlet mean radius to form an extruded hose in which the radial component of fiber orientation exceeds the circumferential component of fiber orientation.

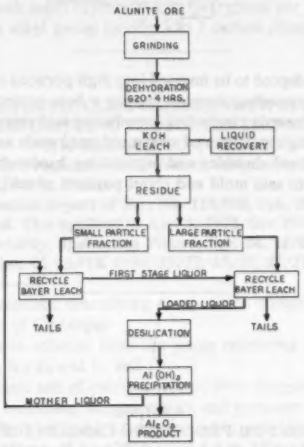
4,057,611
PROCESS FOR RECOVERING ALUMINUM FROM ALUNITE

Larry D. Jennings, Arvada, and Wayne W. Hazen, Wheatridge, both of Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 644,128, Dec. 24, 1975, abandoned. This application May 31, 1977, Ser. No. 801,744

Int. Cl.[2] C01F *7/06, 7/02*

U.S. Cl. 423—127 **8 Claims**



1. A method for recovering aluminum hydroxide from alunite ore which comprises:

a. grinding the ore to provide a particulate product having a maximum particle size up to about −20M;

b. dehydrating the particulate alunite ore;

c. leaching the dehydrated ore with an alkaline solvent or water to remove compounds of sulfur and alkali metals and leave a particulate residue containing aluminum values;

d. separating the particulate residue into two fractions of smaller and larger size particles, wherein the dividing line between the large size particle fraction and the small size particle fraction is between −20M and −100M;

e. digesting one fraction with at least one alkali metal hydroxide to an aluminum to caustic ratio of the leach liquor of about 0.4 and 0.5 to convert the aluminum values in the fraction to soluble aluminates;

f. separating the liquids and solids resulting from step (e);

g. digesting the remaining fraction with the liquor from the separation of step (f) to convert the aluminum values in the fraction into soluble aluminates; and

h. precipitating aluminum hydroxide from the soluble aluminates.

4,057,612
METHODS OF MAKING A DOLL HAVING FUNCTIONAL INSERTS

William Frederick Clark, and Richard Joseph Maddocks, both of London, England, assignors to Lesney Products & Co. Limited, London, England

Filed Apr. 26, 1976, Ser. No. 680,515

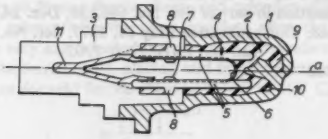
Claims priority, application Australia, Apr. 30, 1975, 18087/75

Int. Cl.[2] B29C *5/04, 5/12*; B29D *3/00*

U.S. Cl. 264—275 **10 Claims**

1. In a method for making a doll in a rotational mold, the doll having at least one spring biased insert member extending into at least two digits of one hand by actuation of which member

the doll hand can be caused to grasp and hold on object, the steps comprising: inserting each said insert member into a hand portion of said mold, said hand portion of said mold being separated from a insert portion of said mold by a projecting shoulder, said insert member having two spaced extending



members adapted to be inserted into digit portions of said mold each said extending member having a boss projecting therefrom, said inserting including introducing said extending members into digit portions of said mold until each said boss engages one said shoulder and introducing hardenable molding material into said mold and about portions of said insert.

4,057,613

PROCESS FOR PRODUCING CARBON DISULFIDE

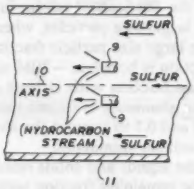
Morton Meadow, Trenton, and Sidney Berkowitz, Highland Park, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 355,991, April 30, 1973, Pat. No. 3,927,185. This application Dec. 11, 1975, Ser. No. 639,725

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.² C01B *31/26*

U.S. Cl. 423—443 **9 Claims**



1. Process for producing carbon bisulfide by the reaction of sulfur and a hydrocarbon in gaseous state in which a stream of hydrocarbon gas comprising a hydrocarbon having at least 3 carbon atoms is introduced into a co-current stream of sulfur vapor in a tubular reactor to form a hot reaction mixture at a temperature at which the noncatalytic reaction of said sulfur and said hydrocarbon to form carbon bisulfide occurs whereby to react non-catalytically said sulfur and hydrocarbon to form carbon bisulfide in said reactor, said reactor having solid walls, wherein the improvement comprises introducing said hydrocarbon gas as a plurality of streams clustered about the axis of the tubular reactor, the flow conditions and mixing conditions of the sulfur stream and hydrocarbon stream being such that the hydrocarbon stream become substantially completely mixed with sulfur vapor before the hydrocarbon comes into contact with a solid surface in the reaction zone, so that a non-catalytic reaction occurs between substantially all the higher hydrocarbon and sulfur prior to such contact.

4,057,614

PROCESS FOR PRODUCING SODIUM FLUORIDE FROM SODIUM SILICOFLUORIDE

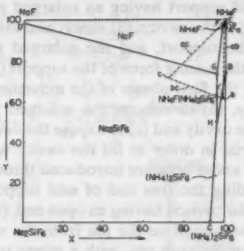
Tetsuhiro Ono; Minoru Aramaki; Tamotsu Mizuno, and Masao Fujinaga, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Nov. 3, 1976, Ser. No. 738,626

Claims priority, application Japan, Nov. 4, 1975, 50-131402

Int. Cl.² C01D *3/02*; C01B *33/12*; C01C *1/16*; C01B *33/00*

U.S. Cl. 423—490 **8 Claims**



1. A process for producing sodium fluoride from sodium silicofluoride comprising the steps of adding sodium silicofluoride to an ammonium fluoride solution in an Na_2SiF_6/NH_4F ratio by gram equivalent of 0.01 to 0.4:1 for double decomposition reaction at a temperature ranging from room temperature to 100° C to give a slurry containing sodium fluoride as crystals and ammonium silicofluoride in a dissolved form, separating the sodium fluoride crystals from said slurry, adding ammonia to the separated solution to decompose said ammonium silicofluoride into silica and ammonium fluoride, and recovering said ammonium fluoride in a dissolved form and said silica in the form of crystals.

4,057,615

METHOD OF TAGGING EXCIPIENTS WITH ^{99m}TECHNETIUM

André Bardy, Morangis; Jacqueline Beydon; Renée Gobin, both of Paris, and Michel Hegesippe, Cernay-la-Ville, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 29, 1975, Ser. No. 599,977

Claims priority, application France, Aug. 6, 1974, 74.27249

Int. Cl.² A61K *29/00, 43/00*; G01T *1/161*

U.S. Cl. 424—1 **7 Claims**

1. A method of using ^{99m}Tc for tagging excipients in medical diagnosis by scintigraphy, which method comprises mixing, in an aqueous solution of alkalimetal pertechnetate, an excipient and a reducing agent complex present in a lower concentration, wherein the association constant of the anion of the reducing agent complex with reduced technetium is less than the association constant of the excipient with reduced technetium, thus forming a radio-pharmaceutical substance which is a complex between the excipient and ^{99m} technetium.

4,057,616

METAL HYDROXIDE SCINTIGRAPHIC AGENTS AND METHOD OF PREPARATION

Robert G. Wolfangel, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 368,867, June 11, 1973. This application Nov. 7, 1975, Ser. No. 629,751

Int. Cl.² A61K *43/00, 29/00*

U.S. Cl. 424—1 **7 Claims**

1. A method for preparing water-insoluble metal hydroxides in the form of substantially spherical particles having diameters between 10μ and 100μ which comprises converting a solution of a hydrolyzable salt of the said metal into an aerosol mist and

directing the said mist into a vessel substantially filled with a stirred solution of a strong base and a wetting agent.

2. A method as set forth in claim 1 wherein the metal hydroxide is selected from the group consisting of ferrous hydroxide, ferric hydroxide and stannous hydroxide.

7. A method as set forth in claim 1 wherein the substantially spherical particles produced are thereafter tagged with a radionuclide.

4,057,617

METHOD OF LABELING PROTEINS WITH TECHNETIUM

Jean Abramovici, 127, Av. du Pesage; André Marie Ermans, 2, Av. de la Foret, both of Ixelles, 1050 Brussels, and Omer Jeghers, 95A, rue Fechereux, 4561 Neufchateau, all of Belgium

Filed Nov. 26, 1975, Ser. No. 635,774

Claims priority, application Belgium, May 15, 1975, 829128; Aug. 12, 1975, 159144

Int. Cl.² A61K *37/04, 33/00, 43/00*

U.S. Cl. 424—1 **18 Claims**

1. A method of labeling fibrinogen with 99m technetium comprising reducing pertechnetate at a pH of about 11 to 12 by the addition of a solution of acetic acid and stannous chloride in the presence of a base, contacting the thus reduced pertechnetate with fibrinogen thereby labeling the fibrinogen with 99m technetium and purifying the resulting mixture by removing unwanted degradation products of the fibrinogen and non-bound technetium.

4,057,618

RADIOIODINATED BLEOMYCIN

Sydney E. Salmon, and Rosa H. Liu, both of Tucson, Ariz., assignors to University Patents, Inc., Stamford, Conn.

Filed Apr. 30, 1976, Ser. No. 682,150

Int. Cl.² A61K *29/00, 43/00*

U.S. Cl. 424—1 **7 Claims**

1. Radioiodinated hydroxyphenylacyl bleomycin, wherein the radioiodine is selected from the group consisting of I^{123}, I^{125} and I^{131}.

4,057,619

OCULAR THERAPEUTIC SYSTEM WITH SELECTED MEMBRANES FOR ADMINISTERING OPHTHALMIC DRUG

Takeru Higuchi, Lawrence, Kans., and Anwar Hussain, Lexington, Ky., assignors to Alza Corporation, Palo Alto, Calif.

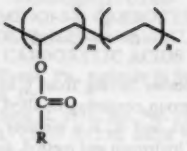
Continuation-in-part of Ser. No. 591,712, June 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 281,446, Aug. 17, 1972, Pat. No. 3,903,880, which is a continuation-in-part of Ser. No. 80,531, Oct. 14, 1970, abandoned. This application July 15, 1976, Ser. No. 705,470

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.² A61K *9/00, 9/22*

U.S. Cl. 424—14 **13 Claims**

1. An ocular therapeutic system for the controlled administration of drug to the eye comprising a flexible body formed of a polymeric material containing a drug capable of diffusing through the material at a therapeutically effective rate, the body shaped, sized and adapted for comfortable insertion and retention in the cul-de-sac of the conjunctiva between the sclera of the eyeball and the lid to be held in place against the eyeball by the pressure of the lid, and wherein said material comprises an ethylene-vinyl alkyl substituted acetate copolymer having the following formula:



which copolymer has a vinyl alkyl acetate content m of about 4 to 80% by weight, an ethylene content n of $(100 - m)\%$ by weight, a melt index of about 0.1 to 1000 grams per 10 minutes, and R is an alkyl group having 2 to 7 carbon atoms.

4,057,620

THERAPEUTIC COMPOSITION WITH MARKED POLYDETOXIFYING PROPERTIES, ESPECIALLY WITH REGARD TO TOBACCO

Robert Louis Prugnaud, Paris, France, assignor to Laboratoire Theranol, Paris, France

Continuation-in-part of Ser. No. 116,660, Feb. 18, 1971, abandoned. This application Apr. 3, 1974, Ser. No. 457,634

Claims priority, application France, Feb. 24, 1970, 70.06599

Int. Cl.² A61K *9/36, 35/12, 35/78, 31/51*

U.S. Cl. 424—35 **7 Claims**

1. A therapeutic detoxifying composition comprising:

a. extract of Crataegus

b. a vitamin selected from the group consisting of vitamins PP, B, B_1, B_6 and C, and

c. an organic salt of quinine selected from the group consisting of ascorbate, lactate, malate and pyruvate

wherein (a), (b) and (c) are present in weight ratios of 4.5 to 450(a) to 7.5 to 750(b) and 1.5 to 150(c).

4,057,621

DESENSITIZING OXALATE DENTAL COMPOSITION AND METHOD OF TREATMENT

David H. Pashley, 427 Scotts Way, Augusta, Ga. 30904, and William C. Outhwaite, Rte. 1, Box 252, N. Augusta, S.C. 29841

Filed May 24, 1976, Ser. No. 689,110

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **3 Claims**

1. A method of desensitizing hypersensitive dentin and cementum by applying to said dentin and cementum a desensitizing amount of a composition which has as the essential ingredient a member selected from the group consisting of a mono- and di-substituted alkali metal and ammonium oxalate in aqueous solution, said ingredient being applied in a desensitizing amount in a concentration of between about 2.0% by weight of said ingredient and a weight percent which is solution saturation.

4,057,622

WATER-IN-OIL CREAMS WITH POLYMERIC EMULSIFIERS

Brigitte Hase; Christian Hase, both of Erkrath; Joachim Galinke, Langenfeld, and Bernd Wegemund, Haan, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Germany

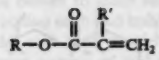
Filed Mar. 25, 1976, Ser. No. 670,362

Claims priority, application Germany, Mar. 29, 1975, 2514101

Int. Cl.² A61K *31/74*

U.S. Cl. 424—78 **7 Claims**

1. A cosmetic emulsion of the water-in-oil type consisting essentially of (1) from 2% to 20% by weight of a polymeric emulsifier capable of forming water-in-oil creams selected from the group consisting of (i) a copolymer of (a) N-vinylimidazole, (b) acrylates of the formula



wherein R is a member having from 6 to 24 carbon atoms selected from the group consisting of alkyl, cycloalkyl, alkylcycloalkyl and oleyl, and R′ is a member selected from the group consisting of hydrogen and methyl, and (c) vinyl acetate wherein the molar ratios of (*a*) + (*c*) : (*b*) are from 1:1 to 1:20 and the molar ratios of (*c*) : (*a*) are 0:1 to 3:1, and (ii) salts thereof with organic or inorganic acids, (2) from 20% to 75% by weight of water and (3) the remainder to 100% by weight of a cosmetically-acceptable oily phase.

4,057,623

COSMETIC EMULSIONS CONTAINING N-VINYLPYRROLIDONE-ALKYL ACRYLATE COPOLYMERS

Brigitte Hase, Erkrath; Joachim Galinke, Langenfeld, and Bernd Wegemund, Haan, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Germany

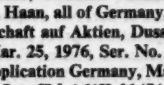
Filed Mar. 25, 1976, Ser. No. 670,381

Claims priority, application Germany, Mar. 29, 1975, 2514100

Int. Cl.[2] A61K *31/74*

U.S. Cl. 424—78 **9 Claims**

1. A cosmetic emulsion of the water-in-oil type consisting essentially of (1) from 2% to 20% by weight of a polymeric emulsifier capable of forming water-in-oil creams consisting essentially of a copolymer of (a) N-vinylpyrrolidone and (b) acrylates of the formula:



wherein R is a member having from 6 to 24 carbon atoms selected from the group consisting of alkyl, alkenyl, cycloalkyl and alkylcycloalkyl, and R′ is a member selected from the group consisting of hydrogen and methyl, and (c) vinyl acetate wherein the molar ratios of [(a)+(c)]:(b) are from 1:1 to 1:20 and the molar ratios of (c):(a) are 0:1 to 3:1, (2) from 20% to 75% by weight of water and (3) the remainder to 100% by weight of a cosmetically acceptable oily material.

4,057,624

COSMETIC EMULSIONS CONTAINING ACRYLAMIDE COPOLYMER

Brigitte Hase, Erkrath; Joachim Galinke, Langenfeld, and Bernd Wegemund, Haan, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Germany

Filed Mar. 25, 1976, Ser. No. 670,382

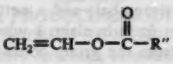
Claims priority, application Germany, Mar. 29, 1975, 2514098

Int. Cl.[2] A61K *31/74*

U.S. Cl. 424—78 **10 Claims**

1. A cosmetic emulsion of the water-in-oil type consisting essentially of (1) from 2% to 20% by weight of a polymeric emulsifier capable of forming water-in-oil creams consisting of a copolymer of (a) acrylamide and (b) esters selected from the group consisting of acrylates of the formula:

wherein R is a member having from 6 to 24 carbon atoms selected from the group consisting of alkyl, alkenyl, cycloalkyl and alkylcycloalkyl, and R′ is a member selected from the group consisting of hydrogen and methyl, and vinyl alkylcarboxylates of the formula:



wherein R″ is alkyl having from 5 to 24 carbon atoms, (2) from 20% to 75% by weight of water, and (3) the remainder to 100% by weight of a cosmetically acceptable oily material.

4,057,625

COSMETIC EMULSIONS CONTAINING N-VINYLPYRROLIDONE/VINYL ALKYLCARBOXYLATE COPOLYMER

Brigitte Hase, Erkrath; Joachim Galinke, Langenfeld, and Bernd Wegemund, Haan, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Germany

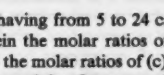
Filed Mar. 25, 1976, Ser. No. 670,383

Claims priority, application Germany, Mar. 29, 1975, 2514099

Int. Cl.[2] A61K *31/74*

U.S. Cl. 424—78 **8 Claims**

1. A cosmetic emulsion of the water-in-oil type consisting essentially of (1) from 2% to 20% by weight of a polymeric emulsifier capable of forming water-in-oil creams consisting of a copolymer of (a) N-vinylpyrrolidone, (b) at least one vinyl $C_{5\text{-}24}$ alkylcarboxylate of the formula



wherein R is alkyl having from 5 to 24 carbon atoms, and (c) vinyl acetate wherein the molar ratios of [(a) + (c)]: (b) are from 1:2 to 1:20 and the molar ratios of (c):(a) are 0:1 to 3:1, (2) from 20% to 75% by weight of water, and (3) the remainder to 100% by weight of a cosmetically acceptable oily material.

4,057,626

PROCESS FOR DETOXIFYING INFLUENZA B VIRUS

Don P. Metzgar, Stroudsburg, and Raymond H. Newhart, Pocono Summit, both of Pa., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Oct. 8, 1976, Ser. No. 731,003

Int. Cl.[2] A61K *39/18*; C12K *7/00*

U.S. Cl. 424—89 **4 Claims**

1. A method of detoxifying a virus of the influenza B group which comprises treating an aqueous concentrate of said virus with from 250 to 500 micrograms of formaldehyde per ml of virus concentrate at a temperature of from 17 to 37° C. for a period of time ranging from 5 to 30 days.

4,057,627

ACNE PREPARATION FOR ORAL ADMINISTRATION

Helmut Anton Stickl, Strarenweg 6, 8033 Krailling, near Munich, Germany

Continuation of Ser. No. 343,096, March 20, 1973, abandoned. This application June 18, 1975, Ser. No. 587,988

Claims priority, application Germany, Mar. 21, 1972, 2213677; Feb. 8, 1973, 2306223

Int. Cl.[2] A61K *39/02*

U.S. Cl. 424—92 **26 Claims**

1. An acne composition for oral administration, comprising inactivated *Corynebacterium acnes* as an immunizing constituent and a pharmaceutically-acceptable carrier therefor.

21. A method of treating acne infection in man by oral administration of a composition according to claim 1.

4,057,628

REMOVAL OF HEPATITIS ASSOCIATED ANTIGEN FROM PLASMA

Rodger L. Bick, Los Angeles, Calif., assignor to William L. Wilson; Rodger L. Bick and Lajos F. Fekete, all of Santa Monica, Calif.

Filed Apr. 19, 1976, Ser. No. 678,024
Int. Cl.² A61K *35/16, 39/12;* C12K *7/00*
U.S. Cl. 424—101 4 Claims

1. Process for separating hepatitis associated antigen from certain desired blood plasma fractions comprising:

preparing an aqueous admixture including the desired blood plasma fraction and from about 2 to 7 weight per volume percent of a block copolymer of ethylene oxide and polyoxypropylene polymer at a temperature of approximately 22 degrees centigrade and a pH of from about 6.5 to 7.5 to form a precipitate in said admixture;

separating said precipitate from said admixture; and

retaining said precipitate for beneficial use.

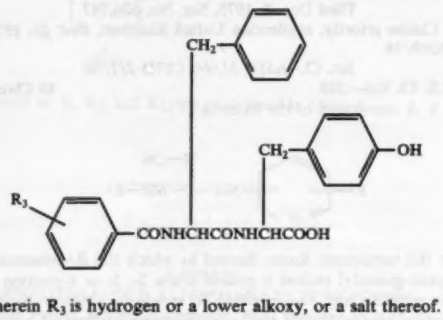
4,057,629

TYROSINE DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Tosaku Miki; Yasuhiro Hosokawa; Tamotsu Miwa; Hiroshi Fujita; Masahide Asano, and Shunzo Aibara, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Division of Ser. No. 639,117, Dec. 9, 1975, Pat. No. 4,025,644.
This application Dec. 20, 1976, Ser. No. 752,826
Claims priority, application Japan, Dec. 18, 1974, 49-145133; Dec. 18, 1974, 49-145134; Apr. 2, 1975, 50-39959; Apr. 4, 1975, 50-41000
Int. Cl.² A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 4 Claims

1. The compound having the formula:



wherein R_3 is hydrogen or a lower alkoxy, or a salt thereof.

4,057,630

ANTIARTHRITIC COMPOSITIONS COMPRISING BIS-COORDINATED GOLD(1+) SALTS AND METHODS OF PRODUCING ANTIARTHRITIC ACTIVITY

David Taylor Hill, North Wales, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 2, 1976, Ser. No. 710,506
Int. Cl.² A61K *31/66*
U.S. Cl. 424—204 14 Claims

8. The method of producing antiarthritic activity which comprises administering internally to an animal organism in an amount to produce said activity a phosphine or phosphite bis-coordinated gold(1+) salt of the formula:

$$[(R_3P)(R_3'P)]Au^+X^-$$

in which:

R and R' which may be the same or different are phenyl, lower alkyl or lower alkoxy; and

X is halide, perchlorate, or tetrafluoroborate.

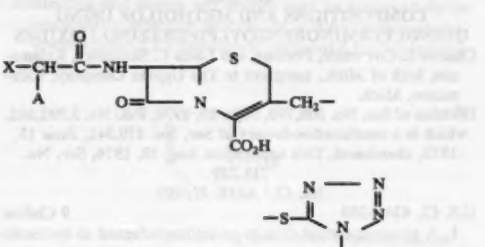
4,057,631

7-(α-SUBSTITUTED PHENYLACETAMIDO)-3-(1-CARBOXYMETHYLTHIOETHYLTETRAZOLYL-5-THIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Sept. 2, 1976, Ser. No. 719,751
Int. Cl.² C07D *501/36;* A61K *31/545*
U.S. Cl. 424—246 6 Claims

1. A compound or its nontoxic alkali metal salts, said compound being of the structure:



in which:

X is thienyl, furyl, phenyl or phenyl monosubstituted with hydroxy, hydroxymethyl, formamido or ureido; and

A is NH_2, OH, COOH, SO_3H, formyloxy or, when the α-C-hydrogen is absent, methoxyimino.

5. A pharmaceutical composition having antibacterial activity comprising a nontoxic antibacterially effective quantity of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

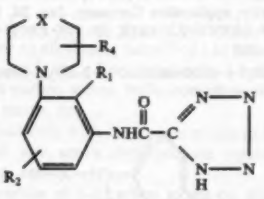
4,057,632

METHOD OF TREATMENT USING TETRAZOLE-5-CARBOXAMIDE DERIVATIVES

John H. Sellstedt, Pottstown, and Dieter H. Klaubert, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 669,570, March 23, 1976, Pat. No. 4,013,647. This application Sept. 24, 1976, Ser. No. 726,706
Int. Cl.² A61K *31/535*
U.S. Cl. 424—248.54 4 Claims

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctvitis, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:



in which

R^1 is CN or $—CONH_2$;

R^2 is hydrogen, lower alkyl, lower alkoxy, halo, polyhalo(lower)alkyl, lower alkyl carbonyl or carb(lower)alkoxy;

X is $—CH_2—$, —O— or

where R^3 is lower alkyl; and
R^H is hydrogen or lower alkyl;
or a pharmaceutically acceptable salt thereof.

4,057,633

COMPOSITIONS AND METHOD OF USING QUINOLYLAMINOBENZOYLPIPERAZINO-1-OXIDES

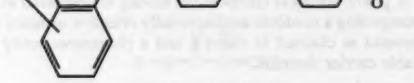
Charles E. Coverdale, Portage, and Louis L. Skaletzky, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 508,790, Sept. 23, 1974, Pat. No. 3,992,382, which is a continuation-in-part of Ser. No. 370,341, June 15, 1973, abandoned. This application Aug. 18, 1976, Ser. No. 715,229

Int. Cl.² A61K *31/495*

U.S. Cl. 424—250 **9 Claims**

1. A pharmaceutical dosage unit form adapted to systemic administration to obtain antihypertensive and anti-anxiety effects which comprises an effective amount for said effects of a compound of the formula:



hydrates thereof and pharmaceutically acceptable acid addition salts thereof, wherein R_1 is halogen, lower alkyl, or trifluoromethyl; R_2 is selected from lower alkyl, benzyl, phenyl and phenyl substituted with one of the groups selected from halogen, lower alkyl, and trifluoromethyl; R_3 is hydrogen; in combination with a pharmaceutical carrier.

4,057,634

ANTIPROTOZOAL(1-ALKYL-5-NITRO-IMIDAZOLYL-2-ALKYL)-PYRIDAZINES

Erhardt Winkelmann, Kelkheim, Taunus; Akhileswer Sinharay, Frankfurt am Main, and Wolfgang Raether, Dreieichenhain, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

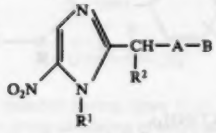
Division of Ser. No. 543,165, Jan. 22, 1975, Pat. No. 3,991,191. This application June 23, 1976, Ser. No. 698,850

Claims priority, application Germany, Jan. 24, 1974, 2403340

Int. Cl.² A01N *9/22*; A61K *31/495*; C07D *237/06*

U.S. Cl. 424—250 **9 Claims**

1. A (1-alkyl-5-nitro-imidazolyl-2-alkyl)-heteroaryl compound of the formula



in which R^1 is methyl or ethyl, R^2 is hydrogen or methyl, A is sulfur, sulfoxide or sulfone, B is

and R^3 is hydrogen, methyl, methoxy, halogen, cyano or nitro.

5. A pharmaceutical composition for the treatment of protozoal diseases, said composition comprising an amount of a compound as in claim **1** which is effective against protozoa in combination with a pharmaceutical excipient.

4,057,635

CARBAMATES OF ERGOLINES AND THERAPEUTIC COMPOSITIONS THEREWITH

Giorgio Ferrari, and Jiri Jan Krepinsky, both of Milan, Italy, assignors to Simes Societa Italiana Medicinali e Sintetici S.p.A., Milan, Italy

Division of Ser. No. 471,701, May 20, 1974, Pat. No. 3,944,582. This application Aug. 19, 1975, Ser. No. 605,878

Claims priority, application Italy, May 23, 1973, 24513/73

Int. Cl.² A61K *31/40*; C07D *457/06*

U.S. Cl. 424—261 **21 Claims**

3. D-6-methyl-8β-(4-methyl-piper-azinylcarbonyloxymethyl)-9,10-didehydroergoline.

10. C-6-methyl-8β-(α-methylphenethyl-aminocarbonyloxymethyl)-9,10-didehydroergoline.

21. A spasmolytic or vasodilator pharmaceutical composition containing as the active ingredient a compound of claim **10**.

4,057,636

ANTIHYPERTENSIVE PYRIDYLGUANIDINE COMPOUNDS

Hans Jorgen Petersen, Herlev, Denmark, assignor to Leo Pharmaceutical Products Ltd. A/S, Ballerup, Denmark

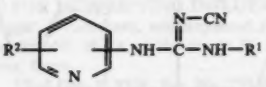
Filed Dec. 1, 1975, Ser. No. 636,747

Claims priority, application United Kingdom, Dec. 20, 1974, 55209/74

Int. Cl.² A61K *31/44*; C07D *211/00*

U.S. Cl. 424—263 **19 Claims**

1. A compound of the formula I



I

or the tautomeric forms thereof in which the R^1-substituted cyano-guanidyl radical is placed in the 2-, 3- or 4-position of the pyridine ring, and in which R^1 stands for aliphatic hydrocarbon having from 1 to 8 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, phenyl, benzyl or phenethyl, and R^2 stands for hydrogen, halogen, hydroxy, lower alkyl or lower alkoxy radicals, or a salt thereof with a non-toxic, pharmaceutically acceptable acid.

12. A composition for the treatment of hypertension containing as an active component, an effective amount of at least one compound according to claim **1**, together with a carrier therefor.

4,057,637

5-MERCAPTOPYRIDOXINE ESTERS

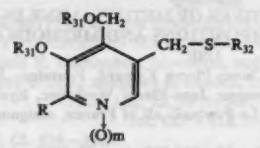
Tsung-Ying Shen, Westfield; Howard Jones, Holmdel; Dennis M. Mulvey, Milford, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 470,231, May 16, 1974, Pat. No. 3,971,797, which is a continuation-in-part of Ser. No. 368,774, June 15, 1973, abandoned. This application May 11, 1976, Ser. No. 685,211

Int. Cl.² A61K *31/44*; C07D *213/62*

U.S. Cl. 424—263 **6 Claims**

1. A compound of structural formula:

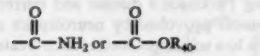


or pharmaceutically acceptable salt thereof, wherein

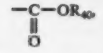
m is 0 or 1;

R is C_{1-5}alkyl;

R_{31} groups are the same or different and are hydrogen

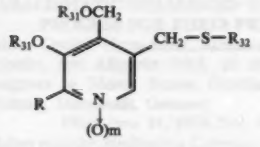


where R_{40} is C_{1-5}alkyl or C_{2-5}alkenyl, R_{32} is hydrogen or



with the proviso that if both R_{31} groups are hydrogen and *m* is 0, then R_{32} is not hydrogen.

5. A method of treating rheumatoid arthritis in humans and warm-blooded animals in need of such treatment which comprises the administration of from 1 mg. to 140 mg. per kilogram of body weight per day of a compound of structural formula:



wherein *m*, R, R_{31} and R_{32} are as defined in claim 1.

4,057,638

BENZOTHIAZOLE ALLOPHANATE FUNGICIDES

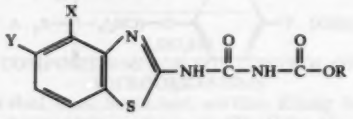
Thomas Fulton Schlaf, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 593,107, July 3, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,746

Int. Cl.[2] A01N *9/12, 9/22;* **C07D** *277/82*

U.S. Cl. 424—270 **28 Claims**

1. A compound of the formula:



where

X or Y may independently be hydrogen, methyl, ethyl, fluorine, chlorine or bromine; and

R is alkyl of 1 to 4 carbon atoms.

19. A method of preventing injury to plants due to fungi consisting essentially of applying to the plants a fungicidally effective amount of a compound of claim 1.

4,057,639

METHOD FOR USING 3-TRICHLOROMETHYL-5-LOWER ALKOXY-1,2,4-THIADIAZOLE COMPOUNDS AS INSECTICIDES AND ACARICIDES

Thomas O. Evrard, Little Rock, Ark., assignor to Olin Corporation, New Haven, Conn.

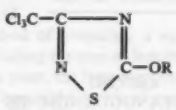
Filed Feb. 14, 1977, Ser. No. 768,238

Int. Cl.[2] A01N *9/12, 9/22*

U.S. Cl. 424—270 **7 Claims**

1. A method for controlling insects and acarids which comprises

contacting said insects and acarids with an insecticidally or acaricidally effective amount of a 3-trichloromethyl-5-lower alkoxy-1,2,4-thiadiazole compound having the formula:



(I)

wherein R is lower alkyl having 1 to about 4 carbon atoms.

4,057,640

5,6,7,8:TETRAHYDROCARBAZOLE-1-CARBOXYLIC ACID DERIVATIVES

Helmut Biere; Hanns Ahrens; Clemens Rufer; Eberhard Schroder, and Henning Koch, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

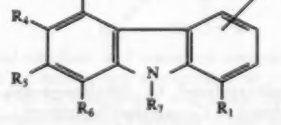
Division of Ser. No. 489,162, July 17, 1974, Pat. No. 3,956,295. This application May 6, 1976, Ser. No. 683,752

Claims priority, application Germany, July 18, 1973, 2337154; June 27, 1974, 2431292

Int. Cl.[2] C07D *209/88;* **A61K** *31/40*

U.S. Cl. 424—274 **6 Claims**

1. A 5,6,7,8-tetrahydrocarbazole of the formula



wherein R_1 is carboxy or a salt thereof with a physiologically acceptable base or an alkyl ester thereof of 1 to 8 carbon atoms,

R_2 through R_4 each are a hydrogen atom, a halogen atom, alkyl or 1–4 carbon atoms, trifluoromethyl, or alkoxy of 1–4 carbon atoms, or

R_5 and R_6 collectively with the carbon atoms to which they are attached also are a cyclopentene, cyclohexene or benzene ring, and

R_7 is a hydrocarbon of 3–8 carbon atoms or, when at least one of R_2 to R_6 is other than a hydrogen atom, a hydrogen atom, methyl or ethyl.

6. A pharmaceutical composition comprising, in admixture with a pharmaceutically acceptable carrier, an antiinflammatorily effective amount per unit dosage of a carbazole of claim 1.

4,057,641
METHOD OF TREATING INFLAMMATION WITH 2-(2,3-DIHYDRO-2-ISOPROPYL-4-OXO-4H-1-BENZOPYRAN-6-YL)PROPIONIC ACID

Richard Anthony Appleton, Kevan Brown, both of Loughborough, England, assignors to Fisons Limited, London, England

Filed Mar. 12, 1975, Ser. No. 557,897

Claims priority, application United Kingdom, Mar. 22, 1974, 12784/74

Int. Cl.[2] A61K *31/35;* C07D *311/72*

U.S. Cl. 424—283 1 Claim

1. A method of treatment of an inflammatory condition which comprises administration of an effective amount of 2-(2,3-dihydro-2-isopropyl-4-oxo-4H-1-benzopyran-6-yl)propionic acid to a patient suffering from such a condition.

4,057,642
ACYL CYANOGUANIDINES

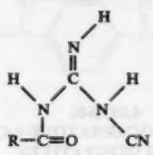
Howard Jones, Holmedl, and Tsung-Ying Shen, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sept. 30, 1975, Ser. No. 618,107

Int. Cl.[2] A61K *31/165, 31/275;* C07C *103/20*

U.S. Cl. 424—304 5 Claims

1. A compound of the formula:

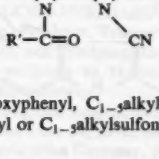


I

wherein

R is C_{1-5}alkylthiophenyl, C_{1-5}alkylsulfinylphenyl or C_{1-5}alkylsulfonylphenyl.

5. A method of treating rheumatoid arthritis which comprises administering to a patient a therapeutically effective amount of a compound of the formula:



IV

wherein

R′ is C_{1-5}alkoxyphenyl, C_{1-5}alkylthiophenyl, C_{1-5}-alkylsulfinylphenyl or C_{1-5}alkylsulfonylphenyl.

4,057,643
ANTIFUNGAL COMPOSITIONS OF BUTANEDIOL BIS (CHLOROACETATE)

Sol J. Barer, Clark, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,801

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—311 4 Claims

1. A method of combatting fungal infection on plants which comprises applying to said plants an antifungal effective amount of 1,4-butanediol bis(chloroacetate).

4,057,644
ACTIVE DERIVATIVES OF METHYLAMINE IN THERAPEUTIC COMPOSITIONS AND METHODS OF USE

Charles Pigerol, Saint-Ouen; Pierre Eymard, Fontaine; Jean-Claude Vernieres, Domene; Jean-Pierre Werbenec, Eysines, and Madeleine Broll, Le Fontanil, all of France, assignors to Labaz, Paris, France

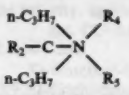
Continuation-in-part of Ser. No. 606,880, Aug. 22, 1975, which is a division of Ser. No. 577,732, May 15, 1975, abandoned. This application July 22, 1976, Ser. No. 707,897

Claims priority, application Belgium, June 3, 1976, 167579

Int. Cl.[2] A61K *31/13*

U.S. Cl. 424—325 13 Claims

1. Method for treating Parkinson's disease and correcting extra-pyramidal disturbances provoked by neuroleptics comprising the administration to a subject in need of such treatment of a dosage of from 10 to 60 mg. per 60 kg. of body weight per day of at least one methylamine derivative of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in which R_2 represents n-propyl, isopropyl or isobutyl, R_4 represents hydrogen or methyl, R_5 represents methyl, ethyl, isopropyl, allyl or propargyl.

4,057,645
SUBSTITUTED PHENOXYALKYL QUATERNARY AMMONIUM COMPOUNDS AS ANTIARRHYTHMIC AGENTS

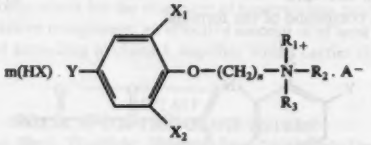
Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,525, July 1, 1974, Pat. No. 3,932,664, which is a division of Ser. No. 164,086, July 19, 1971, Pat. No. 3,875,215. This application Jan. 12, 1976, Ser. No. 648,554

Int. Cl.[2] A61K *31/14, 31/24*

U.S. Cl. 424—329 6 Claims

4. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac antiarrhythmic amount of a quaternary ammonium compound corresponding to the formula



wherein Y represents amino, loweralkylamino or diloweralkylamino; R_1 and R_2 represent lower alkyl; R_3 represents acetonyl; X_1 and X_2 represent halogen; A^- represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; *n* represents one of the integers 2, 3 or 4; HX represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable acid; and *m* represents one of the integers zero and one.

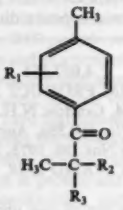
4,057,646

SUBSTITUTED OR UNSUBSTITUTED P-ALKANOYL TOLUENES AS MALE ANTI-FERTILITY AGENTS

Francis E. Harrington, Mendham, and Robert S. Ho, Denville, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Aug. 25, 1976, Ser. No. 717,525
Int. Cl.² A61K 31/12
U.S. Cl. 424—331 5 Claims

1. A method of controlling fertility in male animals, which comprises administering to a male animal in need of said treatment an anti-fertility effective amount of a compound of the formula:



where

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36, or straight chain lower alkoxy, and

R_2 and R_3 each independently represent alkyl having 1 to 2 carbon atoms.

4,057,647

ARALIPHATIC DIHALOGEN COMPOUNDS AND PROCESS FOR THEIR PREPARATION

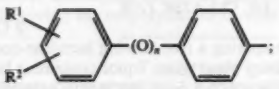
Joachim Gante; Hans-Adolf Kurmeier; Dieter Orth; Erich Schacht, and Albrecht Wild, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed June 14, 1976, Ser. No. 695,804
Claims priority, application Germany, June 28, 1975, 2528958
Int. Cl.² A61K 31/045, 31/085; C07C 31/02, 43/20
U.S. Cl. 424—340 20 Claims

1. An araliphatic dihalogen compound of the formula

Z-Q-Y

wherein Z is



R^1 and R^2 are F, Cl or Br; Q is $—CH(CH_3)—CH_2—$, $—C(OH)(CH_3)—CH_2—$ or $—C(CH_3)=CH—$; Y is CH_2OH and; n is 0 or 1.

18. A method of relieving inflammation in a patient afflicted therewith comprising administering to the patient an anti-flammatorily effective amount of a compound of claim 1, in admixture with a pharmaceutically-acceptable carrier.

4,057,648

COMPOSITIONS FOR THE CONTROL OF MICROORGANISMS

Gerhard Hool, Basel, Switzerland, and Hans Kündig, Johannesburg, South Africa, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 469,993, May 15, 1974, Pat. No. 3,982,022, which is a division of Ser. No. 146,854, May 25, 1971, abandoned. This application Mar. 29, 1976, Ser. No. 671,188
Claims priority, application Belgium, May 16, 1970, 89520
Int. Cl.² A01N 9/24; A61K 31/09
U.S. Cl. 424—341 12 Claims

1. A composition for the control of bacteria comprising antibacterially effective amounts of 5-chloro-2-(2,4-dichlorophenoxy)-phenol and of a compound selected from the group consisting of 2-phenoxyethanol and 2-(p-chlorophenoxy)-ethanol in a proportion within the range of 3 to 1 and 1 to 5.

4,057,649

METHOD OF TREATING FOOD PRODUCTS WITH SELENIUM SALTS

Djemal Eddine Bensalem, 6, rue Charles Valin, Alger, Algeria

Filed Apr. 28, 1975, Ser. No. 572,198
Claims priority, application France, Apr. 26, 1974, 74.14574
Int. Cl.² C12G 1/00
U.S. Cl. 426—15 8 Claims

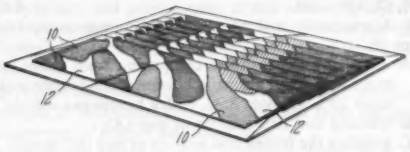
1. In a method of preparing a nutritional material from foodstuffs, including the step of fermentation of said nutritional material with a yeast, the improvement consisting essentially of incorporating into said nutritional material after said fermentation, an effective amount of an anti-mycotic adjuvant to minimumize the effect of residual yeast wherein said adjuvant is a selenium salt.

4,057,650

BACON-LIKE MEAT PRODUCT OF REDUCED FAT CONTENT

Julius L. Keszler, Boston Post Road, Westbrook, Conn. 06498

Continuation of Ser. No. 556,736, March 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 350,142, April 11, 1973, Pat. No. 3,890,451. This application July 1, 1976, Ser. No. 701,797
The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.
Int. Cl.² A23L 1/31
U.S. Cl. 426—92 5 Claims



1. A cured sterilized and uncooked composite nondehydrated meat product having a controlled fat content of less than about 75% by weight and well suited for cutting into bacon-like strips comprising a plurality of meat pieces having a weight of about one-half pound or less integrally bonded into a solid unified meat mass by compression within a mold and heating to an internal temperature of about 135° F, said meat pieces have a lean meat content of about 40% – 50% by weight and a fat content of at least about 50% by weight, said product having integrated boundaries between said abutting meat pieces as well as between lean and fat areas thereof, and a binder at least partially absorbed by the meat pieces and wherein said heating effects sterilization and fused integration of the meat pieces at said boundaries without the binder being substantially noticeable in the final product, said meat pieces comprising about 75% or more of the product, said binder consisting essentially of an aqueous brine curing agent and ground lean meat, the ratio of said brine to meat pieces being 1:6 to 1:15 and said ground meat comprising about 10% by weight or less of the composite meat product.

4,057,651

MEAT TRAY

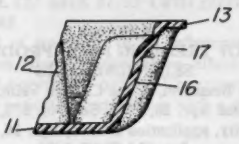
John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 2, 1975, Ser. No. 537,990

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976 as document No. B537,990

Int. Cl.[2] B65D *1/36, 81/26*

U.S. Cl. 229—2.5 6 Claims



1. A package consisting of a plurality of pieces of cut meat in a tray comprising a flat rectangular bottom wall having rounded corners and having a plurality of holes therein to receive and retain juices, side walls integral with said bottom wall disposed upwardly and flared outwardly of said bottom wall, each of said side walls being integral with adjacent side walls at the curved corners of said tray, an integral flange extending outwardly of said side walls at the upper edges thereof, said side walls being formed with flutes transversely of said walls from the bottom wall to said flange, the curved corner surfaces at joinder of said side walls being formed as an upper portion adjacent said flange in a smooth curve to which said side walls are tangent and a lower portion in a smooth curve of curvature reverse to that of said upper portion to thereby provide a fluted corner terminating at a shoulder between said portions and an overwrap of transparent film about said tray and pieces of meat contained therein.

4,057,652

FREEZE PARTICLE PROCESS

Benjamin Lawrence, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 4, 1976, Ser. No. 729,565

Int. Cl.[2] A23F *1/08, 3/00*

U.S. Cl. 426—388 6 Claims

1. A process for making an instant beverage comprising the steps of:

A. forming a first mixture comprising from about 15% to about 80% of an aromatic beverage condensate and from about 20% to about 85% of dry beverage solubles;

B. freezing said first mixture of step (A);

C. grinding the frozen first mixture of step (B) thereby forming frozen particles; and

D. forming a second mixture comprising from about 0.2% to about 15% of the particles of step (C) and from about 85% to about 99.8% of dry beverage solubles chilled to a temperature of less than about 10° F; and

E. warming said second mixture of step (D) thereby melting the frozen particles and imparting aroma and flavor to the mixture.

4,057,653

METHOD OF FORMING FOODSTUFFS HAVING A UNIFORM CROSS-SECTION

Alvin Borsuk, and Charles H. Johnson, both of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Division of Ser. No. 557,256, March 11, 1975, Pat. No. 3,948,158. This application Nov. 21, 1975, Ser. No. 634,272

Int. Cl.[2] A23L *1/31, 1/34*

U.S. Cl. 426—513 4 Claims

1. The method of obtaining a uniform cross-sectionally dimensioned loaf of food in a mold filled with a stuffable food material and thereafter subjected to heat for cooking same and thereafter chilling for preparing same for removal from the mold, wherein the mold includes a movably positionable member movable in one direction during cooking of the food material and upon expansion thereof and movable in the opposite direction upon the application of a force thereto during chilling of the food material and the contraction thereof, which method comprises the steps of: mounting said member relative the mold such that the member will resist movement in either direction and be maintained at a set position until subjected to a force of a given magnitude, heating the mold and food material to cook the food material whereby expansion of the food material causes movement of said member in said one direction, chilling the mold and cooked food material, and squeezing the cooked food material in the mold during chilling by applying to said member a force of a predetermined value to move said member in said opposite direction.

4,057,654

WHEAT-GERM PRODUCT AND ITS USE

Walton J. Smith, Rte. 4, Grafton, N.H. 03240

Continuation of Ser. No. 460,386, April 12, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,784

Int. Cl.[2] A21D *2/38, 10/00*

U.S. Cl. 426—555 4 Claims

1. A method for the use of raw undefatted wheat germ in baked food products which comprises

1. baking under conditions normally used for biscuits and cookies a batter comprising by weight of from 20 to 60% raw wheat germ, from 10 to 40% flour, from 5 to 20% added fat, from 6 to 30% soluble carbohydrate and 0 to 20% water to provide a finished prebaked intermediate product,
2. grinding and mixing from 10 to 20% by weight of said finished prebaked intermediate product with a baking mix comprising flour and water to provide a second batter and
3. baking said batter to provide a baked, undefatted wheat germ - containing food product.

4,057,655

PROCESS FOR PREPARING A LACTULOSE-CONTAINING POWDER FOR FEED

Katsuto Okada, Tokyo; Katsuhiro Ogasa, and Mamoru Tomita, both of Yokohama, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed July 6, 1976, Ser. No. 702,680

Claims priority, application Japan, July 4, 1975, 50-81936; July 8, 1975, 50-83188

Int. Cl.[2] A23K *1/08*

U.S. Cl. 426—583 2 Claims

1. A process for preparing a free-flowing lactulose-containing powder from a dairy plant waste liquor containing lactose which waste liquor is selected from the group consisting of cheese whey solutions, casein whey solutions, quarque whey solutions, partially delactosed whey solutions and permeates obtained by the ultrafiltration of whey solutions or skim milk, which comprises adding calcium hydroxide to said solution to adjust the pH of said solution to a value within the range of 9.4 to 11.2, heating the resulting solution at a temperature of from about 60° to 130° C for a time sufficient to reduce the pH to a value within the range of from 7.5 to 9.0; then homogenizing, concentrating and drying.

4,057,656

HIGH-PROTEIN QUICK COOKING MEAT-LIKE FOOD MADE FROM PLANT PROTEIN MATERIALS

Albert Spiel, 98 De Haven Drive, Yonkers, N.Y. 10703

Division of Ser. No. 275,957, July 28, 1972, which is a continuation-in-part of Ser. No. 218,117, Jan. 17, 1972. This application July 3, 1974, Ser. No. 485,615

Int. Cl.[2] A23J *3/00;* A23K *1/14;* A23L *1/20*

U.S. Cl. 426—630 12 Claims

1. A method of preparing chunks useful in the production of protein food products which, when hydrated, are palatable,

meat-like in texture, bland, chewable chunks comprising the steps of:

a. preheating at 160° to 200° F. a proteinaceous feed selected from the class consisting of solvent-extracted meal, grits, and flakes of a proteinaceous vegetable material having 30 weight percent or higher protein and an NSI of about 30 to about 70 whereby said feed contains moisture in the amount of 5 to 10 weight percent;

b. force feeding said preheated feed into a screw worm press having an impervious barrel, a screw worm rotating in said barrel and a cone slideably mounted on the shaft of the screw worm at the outlet of said press for adjusting the pressure along said screw worm;

c. subjecting said feed in said press to a mechanical pressure of at least 1,800 to 5000 pounds per square inch for a time of 1.5 to 5 minutes and at a temperature of 150° to 200° C. to convert said moisture into steam whereby said feed is partially disembittered, toasted without scorching, and is compacted into a hard and substantially fused mass; and

d. fragmenting the mass into chunks which when hydrated and dried are cohesive, porous, bland, storable, appetizing in appearance, high in protein and quick and easy to cook or prepare for consumption and which are chewable, light-colored, meat-like in texture, bland and palatable when rehydrated.

4,057,657

CURABLE PRE-POLYMER COMPOSITIONS, METHOD OF MAKING AND METHOD OF COATING ARTICLES THEREWITH

John Lyndon Garnett, 29 Arabella Street, Longueville, New South Wales, and John Denis Rock, 12 Kara Street, Lane Cove, New South Wales, both of Australia (2066)

Filed Dec. 4, 1974, Ser. No. 529,384
Claims priority, application Australia, Dec. 13, 1973, 5977/73
Int. Cl.² B05D *3/06*
U.S. Cl. 427—44 12 Claims

1. A process for the preparation of a prepolymer capable of being cured by ultra-violet or ionising radiation, comprising the steps of subjecting a mixture of a polymerizable ethylenically unsaturated monomer or a mixture of such monomers and a polymer selected from the group consisting of polyamides, polyesters including alkyl resins, polycarbonates, epoxy resins, polyvinylalcohols, polyvinylchlorides, polysilanes and polysiloxanes, to ultra-violet or ionising radiation, until a predetermined but incomplete degree of polymerisation is achieved; and removing the prepolymer so formed from the radiation.

4,057,658

METHOD OF IMPREGNATING WOOD WITH PLASTICS

Gunnar Arthur Sigvard Sjöö, Memoargatan 12, 422 42 Hisings Backa, and Jan Anders Sundlin, Fack 400, 41 Goteborg, both of Sweden

Filed Dec. 5, 1974, Ser. No. 529,776
Claims priority, application Sweden, Dec. 14, 1973, 7316900
Int. Cl.² B05D *3/06*
U.S. Cl. 427—44 9 Claims

1. In a method of increasing the strength of wood through impregnation thereof with a polymerizable liquid, comprising

positioning the wood in a container,

evacuating said container to remove moisture and air from the wood, and

subsequently impregnating the wood under pressure with a polymerizable liquid and a setting agent,

the improvement in which the setting agent is dormant at temperatures up to 30° C. but is rapidly activated at higher temperatures and comprises at least one of the following substances,

2,2-bis(t-butyl peroxy) butane,

2,5-dimethyl-2,5-di(t-butyl peroxy) hexane,

2,5-dimethyl-2,5-di(t-butyl peroxy) hexyne-3,

n-butyl-4,4-bis(t-butyl peroxy) valerate,

1,1-bis(t-butyl peroxy)-3,3,5-trimethyl cyclohexane,

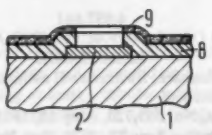
and after the impregnating, polymerization of the polymerizable liquid in the wood impregnated therewith is conducted in an oven at temperatures in the range of 60° to 150° C.

4,057,659

SEMICONDUCTOR DEVICE AND A METHOD OF PRODUCING SUCH DEVICE

Erich Pammer, Munich, and Friedrich Schnell, Haar, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 5, 1975, Ser. No. 584,147
Claims priority, application Germany, June 12, 1974, 2428373
Int. Cl.² B05D *5/12*
U.S. Cl. 427—89 4 Claims



1. In a method of producing electrical contacts on a semiconductor device wherein a semiconductor body is provided with at least one metal contact layer, the area around each such contact layer is completely coated with an insulating layer leaving free a contact surface on each such metal contact layer, at least two different metal layers are additionally successively applied onto each one of said contact surfaces so that the outer metal layer consists of a soft-solderable metal and has a thickness substantially greater than that of the two other metal layers combined, and any excess metal on said insulating layer is removed by a photo-lacquer etching technique, the improvement which comprises:

vapor depositing as each of said metal contact layers an aluminum layer,

applying a layer of a heat-resistant organic insulating material selected from the group consisting of polyphenylene, polyxylene, and polysiloxane, as said insulating layer,

vapor depositing as a first one of said two additional metal layers a layer of titanium onto each one of said contact surfaces,

applying as the outer one of said two additional metal layers a layer of soft-solderable metal selected from the group consisting of copper and silver, and

removing any excess of such additional metals from said insulating layer on areas around each one of said contact surfaces by etching while using an etch mask composed of a photo-lacquer.

4,057,660

METHOD FOR PRODUCING THERMOPLASTIC FILM ELECTRIC ELEMENT

Masafumi Yoshida; Tohru Sasaki, and Shuji Terasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

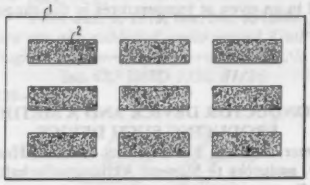
Filed Aug. 28, 1975, Ser. No. 608,612
Claims priority, application Japan, Sept. 3, 1974, 49-100506
Int. Cl.² B05D *5/12*
U.S. Cl. 427—100 9 Claims

1. A method for producing a thermoplastic film electric element comprising the steps of:

attaching electrically conductive thin layers on both surfaces of a thermoplastic film, respectively;

applying a D.C. electric field across the electrically conductive thin layers to polarize the film, then removing at least a part of the electrically conductive thin layers, and there-

after attaching a plurality of non-continuous, electrically conductive, thin-layer, operating electrodes on the film



surfaces from which the part of the electrically conductive thin layers has been removed.

4,057,661

METHOD OF MANUFACTURING A THIN-FILM ELECTRODE

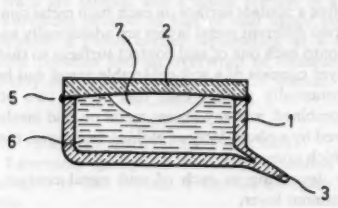
Harry Zlist, Erlenbach, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Division of Ser. No. 577,723, May 15, 1975, abandoned. This application June 28, 1976, Ser. No. 700,453

Claims priority, application Switzerland, May 30, 1974, 7378/74

Int. Cl.² C23C *13/02*

U.S. Cl. 427—125 **3 Claims**



1. A method of manufacturing a thin-film electrode consituting a multi-layer electrode structure supported at an electrically insulating surface of a supporting element, comprising the steps of:

a. depositing a thin-film layer on said surface and, in succession,

b. depositing an additional thin-film layer on top of the previously deposited thin-film layer,

c. said second depositing step being carried out at least once,

d. the last one of the depositing steps comprising vapor depositing an electrochemically active black layer of gold, said vapor deposition being carried out in a vacuum chamber under reduced pressure of a residual gas in a pressure range of 0.1 to 2 Torr.

4,057,662

BLOCK-RESISTANT GYPSUM BOARD

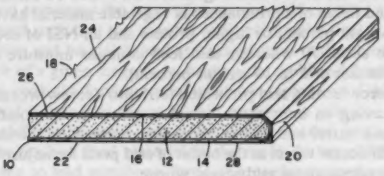
Robert M. Johnson, Kenmore; Daniel A. Winkowski, Tonawanda, and Rodney A. Stilling, Snyder, all of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Feb. 12, 1976, Ser. No. 657,377

Int. Cl.² B05D *5/00, 7/00;* B32B *31/12, 31/14*

U.S. Cl. 427—209 **5 Claims**

1. The method of making gypsum wallboard comprising the steps of forming a set gypsum core between face paper and back paper, modifying said gypsum wallboard of set core and paper by coating said back paper with a formed-in-place thin film of polyethylene, and also modifying said gypsum wallboard of set core and paper by coating said face paper with a protective acrylic resin coating formed in place having the characteristic of tending to adhere to a back paper of an adjacent stacked wallboard if said wallboard is stacked with the resin coating adjacent plain uncoated back paper following the



application of said resin coating, whereby said wallboards may be stacked face to back without causing blocking.

4,057,663

PROCESS FOR TREATING HYDROPHOBIC SURFACES

John M. Preston, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Aug. 10, 1976, Ser. No. 713,149

Int. Cl.² C23C *3/02*

U.S. Cl. 427—307 **9 Claims**

7. A process for making the hydrophobic surface of a polymeric material hydrophilic and receptive to a metal plating which comprises:

a. contacting the polymeric material with an alkaline cleaner solution for a period of 1–3 minutes at a temperature of about 60° C.;

b. water rinsing the polymeric material for a period of 1–3 minutes;

c. immersing the polymeric material in an MPA concentrate having a P_2O_5 concentration of 70–82% at a temperature of 100°–140° C. for a period of ten minutes to eight hours;

d. water rinsing the polymeric material for a period of 1–3 minutes; and

e. plating the polymeric material with a suitable metal.

4,057,664

PROCESS FOR THE PRODUCTION OF QUICK-CURING EPOXIDE RESIN COATINGS WHICH ARE RESISTANT TO CHEMICALS AND TO WEATHERING

Thaddeus Audykowski, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,787

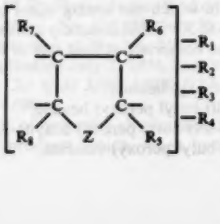
Claims priority, application Switzerland, Aug. 28, 1974, 11726/74

Int. Cl.² B05D *1/02, 1/34*

U.S. Cl. 427—386 **12 Claims**

1. Process for the production of chemically resistant, firmly adhering epoxide resin layers on solid surfaces by mixing a liquid component (A), which contains the epoxide compound, having on average more than one epoxide group in the molecule, with a liquid component (B) which contains the curing agent, shortly before use, with exclusion of unreacted organic solvents, applying this mixture to the surface, and subsequent curing, characterised in that

a. the curing agent contained in the component (B) consists essentially of 1.7 to 15.5% by weight of $Zn(BF_4)_2$, 7.0 to 65.0% by weight of a cyclic ether or thioether of the formula I

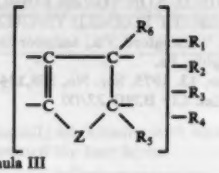


(I)

-continued

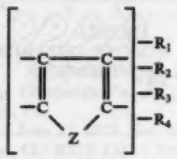
or of the formula II

(II)



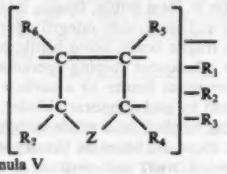
or of the formula III

(III)



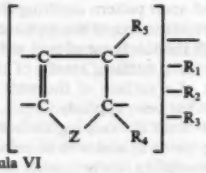
wherein R_1, R_2, R_3, R_4, R_5, R_6 and R_7 denote hydrogen atoms or monovalent organic radicals and the radicals R_1, R_2, R_3, R_4 and R_5 can also be members of a ring system, R_8 denotes a monovalent organic radical and Z denotes an oxygen atom or sulphur atom, or of a cyclic ether or thioether which contain, per molecule, at least two monovalent radicals of the formula IV

(IV)



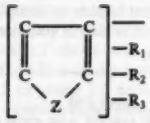
or of the formula V

(V)



or of the formula VI

(VI)



wherein R_1, R_2, R_3, R_4, R_5, R_6 and R_7 denotes hydrogen atoms or monovalent organic radicals, and the radicals R_1, R_2 and R_3 can also be members of a ring system, and Z denotes an oxygen atom or sulphur atom, 10 to 90% by weight of an acid ester of phosphoric acid or of pyrophosphoric acid or of a phosphonic acid ester which contains at least on cyclic phosphonate group with 5 or 6 ring atoms and 1.0 to 9.0% by weight of water, and that

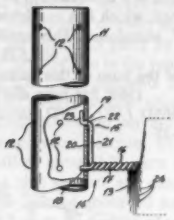
b. the components (A) and (B) are mixed in a ratio such as to provide 0.5 to 2.5 parts by weight of $Zn(BF_4)_2$ per 100 parts by weight of the epoxide compound or of the epoxide compound mixture.

4,057,665

ARTIFICIAL TREE STRUCTURE

John W. Szulewski, 245 Oakville Ave., Dorval, Quebec, Canada

Filed Apr. 21, 1976, Ser. No. 679,076
Int. Cl.² A47G 33/06
U.S. Cl. 428—8 6 Claims



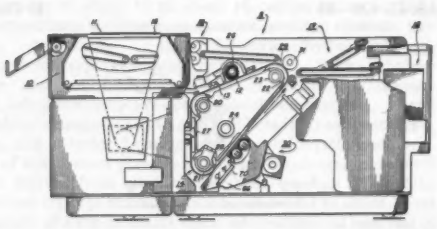
1. An artificial tree comprising an elongated trunk member supportable from a lower end to extend on a vertical axis, said trunk member having at least a tubular portion, a plurality of pairs of spaced-apart apertures in said tubular portion, said pairs of spaced-apart apertures each lying on an axis substantially coextensive to the long axis of said elongated member, a plurality of limb members each having a connector end, said connector end having engageable means constituted by a first rod section and a second rod section extending substantially transverse to said first rod section, said second rod section including an angled rod portion extending substantially in the same direction as said first rod section and terminating in an upwardly extending end portion substantially transverse to said first rod section, said first rod section being locatable in a lower one of a pair of said pairs of apertures, said angled rod portion being engageable within an uppermost aperture of a pair of said pairs of apertures whereby each said limbs can be attached and deteched from said trunk member by vertical arcuate displacement thereof.

4,057,666

MAGNETIC BRUSH DEVELOPER ROLL FOR ELECTROSTATIC REPRODUCTION MACHINES

Arthur Drummond, Jr., Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1973, Ser. No. 410,835
Int. Cl.² B32B 7/02
U.S. Cl. 428—35 2 Claims



1. A sleeve like part for use as a magnetic brush developer comprising a first base material impregnated with particles of a second material, to form a rigid part, said second material being harder than said first base material whereby the wear resistance of said second material is greater than the wear resistance of said first base material, and a third electrically conductive filler material to promote electrical conductivity of said part.

4,057,667

ORIENTED SARAN COEXTRUDATE

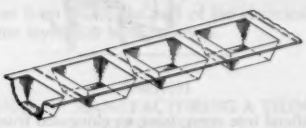
Glenn C. Wiggins, Midland; Marvin J. Kreh, Essexville, and Robert S. Davis, Midland, all of Mich., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 237,953, March 24, 1972, Pat. No. 3,924,051, which is a continuation of Ser. No. 70,524, Sept. 8, 1970, abandoned, which is a continuation of Ser. No. 630,889, April 14, 1967, abandoned. This application Aug. 6, 1975, Ser. No. 602,535

The portion of the term of this patent subsequent to Dec. 26, 1989, has been disclaimed.

Int. Cl.² B65D *1/00;* A21D *10/02;* B32B *15/08, 27/08*

U.S. Cl. 428—35 9 Claims



1. A pouch comprising two sheets of a bilaterally oriented plastic laminate comprised of a first layer of a vinylidene chloride-vinyl chloride copolymer containing a predominant amount of vinylidene chloride in the copolymer molecule, and a second layer of an ethylene-unsaturated ester type copolymer containing a predominant amount of ethylene in the copolymer molecule and wherein said unsaturated ester is selected from the group consisting of vinyl acetate and isobutyl acrylate, said first layer and said second layer being non-separable with tape and said laminate being prepared by coextruding said first layer and said second layer as a plural layered tube, chilling said tube at a temperature of about 5° C to about 25° C and then tempering said tube at a temperature of about 20° C to about 50° C immediately prior to blowing said tube into a bubble with a fluid whereby the molecules of said copolymer are bilaterally oriented and wherein the total area of said bubble is at least about 16 times the area of said tube, said layer of vinylidene chloride-vinyl chloride of one laminate being joined to said layer of vinylidene chloride-vinyl chloride of the other laminate to form said pouch.

4,057,668

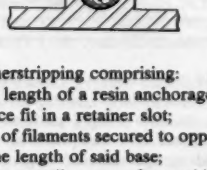
PILE WEATHERSTRIPPING WITH INTERFITTING SHAPED BASE

Jay C. Metzler, Pittsford, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Division of Ser. No. 536,315, Dec. 26, 1974, Pat. No. 4,024,004. This application Feb. 28, 1977, Ser. No. 772,476

Int. Cl.² D02G *3/00*

U.S. Cl. 428—85 10 Claims



1. A pile weatherstripping comprising:

a. a continuous length of a resin anchorage base shaped for an interference fit in a retainer slot;

b. even lengths of filaments secured to opposite sides of said base along the length of said base;

c. said filaments extending away from said base in the same general direction on each of said sides of said base; and

d. said filaments being long enough and dense enough to form insulating pile rows extending out of said retainer slot when said base is fitted in said retainer slot.

4,057,669

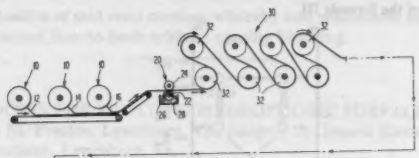
METHOD OF MANUFACTURING A DRY-FORMED, ADHESIVELY BONDED, NONWOVEN FIBROUS SHEET AND THE SHEET FORMED THEREBY

Albert L. McConnell, Wallingford, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Mar. 13, 1975, Ser. No. 558,134

Int. Cl.² B29D *27/00*

U.S. Cl. 428—152 24 Claims



1. A method for forming a bulky, flexible, stretchable, nonwoven fibrous sheet, said method comprising the steps of:

A. dry-forming a low integrity, fibrous web having a basis weight of from about 5 to about 100 lbs. per ream of 2,880 square feet;

B. applying a temporary binder uniformly and continuously over the planar extent of a surface of the web;

C. setting the binder to form brittle, fragile, interfiber bonds which establish sufficient web integrity for subsequent processing, said fragile bonds being brittle enough to be broken during a subsequent creping operation; thereafter

D. applying a permanent binder to a surface of the web which is stabilized by said temporary binder, said permanent binder being applied in a solids weight percent of from about 5 to about 30, based on the dry weight of the temporarily bonded web, said permanent binder being applied in a spaced-apart pattern covering from about 5 to about 60% of the surface area of the web and extending at least 10% through the thickness of said web;

E. adhering to a creping surface, by use of the permanent binder, the areas of a surface of the web in which the permanent binder has been applied;

F. creping said web from the creping surface for breaking temporary brittle bonds in said web to enhance the bulk, flexibility and extensibility characteristics of said web; and

G. setting said permanent binder to complete the formation of the nonwoven sheet which is stabilized by said permanent binder.

4,057,670

COOKING SURFACES OF GLASS-CERAMIC PLATES WITH LAYERS WITH DIFFERENT VALUES FOR RADIATION TRANSMISSION

Herwig Scheidler, Finthen, Germany, assignor to JENAer Glaswerk Schott & Gen., Mainz, Germany

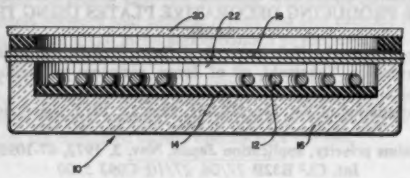
Filed Jan. 28, 1976, Ser. No. 653,085

Int. Cl.² B32B *17/06*

U.S. Cl. 428—189 16 Claims

1. A glass-ceramic cooking plate for use with heating elements on the underside of the plate, the heat energy from the heating elements being transmitted through the plate to the upper surface of the plate, said plate comprising a glass-ceramic base layer having a high transmittance value for radiation whose wave length is from 0.7 to 5 microns and a covering

layer smaller in thickness than the base layer, tenaciously adhered to the top of the base layer, said covering layer absorbing substantially all radiation with wave lengths of 0.7 to 5 microns transmitted the base layer.



4,057,671
HEATED LAMINATED WINDOW AND METHOD OF ASSEMBLING SAME

George W. Shoop, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 27, 1975, Ser. No. 591,218
Int. Cl.² B32B *15/00*; B60L *1/02*
U.S. Cl. 428—208 **19 Claims**

1. A transparent electroconductive window comprising a non-electroconductive assembly element of transparent material selected from the group consisting of glass, polycarbonates, acrylic esters, polyesters, polyvinyl acetals and polyurethanes, an electroconductive circuit portion selected from the group of transparent electroconductive coatings, lines of electroconductive material and electroconductive wire carried by said element, and a self-soldering bus substantially all metallic bar consisting essentially of a mixture of finely divided particles of a highly conductive metal selected from the group consisting of silver, gold, platinum, copper and aluminum and high melting point electroconductive alloys within an electroconductive metal alloy having a fusion point between about 70° C. and about 150° C., said mixture consisting essentially of 85–97 parts by weight of particles of said metal and 15–3 parts by weight of said metal alloy.

4,057,672
COMPOUNDED POLYVINYL CHLORIDE

Mark D. Creekmore, Akron, Ohio, and Henry F. Panning, Abington, Pa., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 364,796, May 29, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 532,426
Int. Cl.² B32B *27/30*
U.S. Cl. 428—220 **11 Claims**

1. A cast compounded polyvinyl chloride film having a thickness of about 0.5 to about 4.5 mils where said polyvinyl chloride has an inherent viscosity in the range of about 1.05 to about 1.15 as determined in cyclohexanone according to ASTM D-1243-66 said film characterized when having a thickness of about 0.8 mils, by an Elmendort tear resistance in the range of about 100 to about 650 grams/mil according to ASTM No. D-1922-61T, a coefficient of friction (film against metal) of about 0.2 to about 2.0 according to ASTM No. D-1894-63, a water vapor transmission rate of 37.8° C. and a humidity of about 90 percent in the range of about 15 to about 50g/100 in²/24 hrs according to ASTM No. E-96-66, Procedure E, and an oxygen transmission of about 350 to about 1200cc/100 in²/1 atm according to ASTM No. D-1434-63, said film comprised of 100 parts by weight of polyvinyl chloride resin, from about 20 to about 45 parts by weight of at least one plasticizer selected from at least one of di(2-ethylhexyl)adipate, epoxidized soyabean oil, epoxidized linseed oil, acetyltributylcitrate, butylbenzylphthalate, dibutyl sebacate, butylstearate, acetyl triethyl citrate, p-tert-butylphenyl salicylate, butylphthalyl butyl glycolate, di-(2-ethylhexyl)phthalate, diethyl phthalate, diisobutyl adipate, diisooctyl phthalate, diphenyl-2-ethylhexyl phosphate, ethylphthalyl, ethyl glycolate, glycerol monooleate, monoisopropyl citrate, mono-, di- and tristearyl citrate, triacetin(glycerol triacetate), triethyl citrate, 3-(2-xenoyl)-1,2-epoxy propane, 1,3-butylene glycol adipic acid polyester of about 1700 to about 2200 molecular weight terminated with at least one organic acid selected from myristic, palmitic and stearic acids, dicyclohexyl phthalate, di(2-ethylhexyl)-acelate, di-n-hexyl azelate, dihexyl phthalate, diphenyl phthalate, diphenyl phthalate, epoxidized butyl esters of linseed oil fatty acids, diisononyl adipate and diisononyl phthalate, from about 0.1 to about 2.5 parts by weight of a pigment having an average particle size in the range of about 2 to about 10 microns selected from pigments comprised of about 50 to about 100 parts by weight percent silica (SiO_2), and correspondingly none to about 50 weight percent other oxides selected from aluminum, magnesium, calcium, iron, potassium and sodium, from about 0.05 to about 0.25 parts by weight of a heat stabilizer comprising zinc stearate and calcium stearate in a zinc to calcium weight ratio of about 1:1 to about 3.9:1, from about 0.25 to about 1.5 parts by weight of tris-nonylphenyl phosphite chelator, from about 2 to about 9 parts by weight of at least one surfactant selected from: polyoxyethylene (20) sorbitan monooleate, the mono and diglycerides of fat-forming fatty acids, a nonylphenoxy polyoxyethylene ethanol containing 4 to 5 moles of ethoxylate, glycerol monooleate, sorbitan monooleate, polyoxyethylene(9) monooleate, α-alkyl, α-alkenyl and α-alkylaryl-omega-hydroxypoly(oxyethylene) comprised of at least one of α-(2,4,6-triisobutylphenyl)-omega-hydroxypoly(oxyethylene), α-(Z)-9-octadecenyl-omega-hydroxypoly-(oxyethylene), and α-alkyl (C_{16}-C_{18})-omega-hydroxypoly(oxyethylene), α-alkyl-omega-hydroxy poly(oxyethylene) derived from ethylene oxide and C_{11}-C_{15} straight chain secondary alcohols, n-alkyl-sulfonate where said alkyl group has 10–18 carbon atoms, α-di-sec-butylphenyl-omega-hydroxypoly(oxyethylene) derived from ethylene oxide and di-sec-butylphenol, α-dodecyl-omega-hydroxypoly(oxyethylene) mixture of dihydrogen phosphate and monohydrogen phosphate esters derived by esterification of the product of ethylene oxide and n-dodecyl alcohol, α-(p-dodecylphenyl)-omega-hydroxypoly(oxyethylene) derived from ethylene oxide and dodecylphenol, α-(p-nonylphenyl)-omega-hydroxxypoly(oxyethylene) mixture of dihydrogen phosphate and monohydrogen phosphate esters derived from esterification of α-(p-nonylphenyl)-omega-hydroxypoly(oxyethylene), α-(p-nonyl phenyl)-omega-hydroxypoly(oxyethylene) derived from condensation of nonylphenol and ethylene oxide, α-(p-nonylphenyl)-omega-hydroxypoly(oxyethylene)sulfate, ammonium and sodium salts where said nonyl group is a propylene trimer isomer and said poly (oxyethylene) content averages about 4 moles, poly(oxypropylene) block polymer with poly(oxyethylene) having an average molecular weight of about 11,000 to about 18,000, polyoxyethylene(20)sorbitan monostearate, polyoxyethylene(20)sorbitan tristearate, polyoxyethylene(20)sorbitan monooleate, polyoxyethylene(20)sorbitan trioleate, sodium n-alkylbenzenesulfonate where said alkyl group contains an average of about 10 to about 16 carbon atoms, sorbitan monopalmitate, sorbitan monostearate, sorbitan trioleate, sorbitan tristearate, α-[p-(1,1,3,3-tetramethylbutyl)phenyl]-omega-hydroxypoly(oxyethylene) derived from ethylene oxide and p-(1,1,3,3-tetramethylbutyl)phenol, tetrasodium N-(1,2-dicarboxyethyl)-N-octadecyl-sulfosuccinamate, and α-tridecyl-omega-dicarboxyethyl)-N-octadecyl-sulfosuccinamate, and α-tridecyl-omega-hydroxypoly(oxyethylene) mixture of dihydrogen phosphate and monohydrogen phosphate esters derived from esterification of the product of ethylene oxide and tridecyl alcohol, and from about 0.1 to about 1 part by weight of a slip-antiblock agent selected from at least one of the group consisting of ethylene-N,N'-bis-oleamide, hydrofol glyceride, hydrogenated fish oil, calcium ricinoleate and fatty acids amides selected from amides with aliphatic hydrocarbon chains containing in the range of about 16 to 40 even numbered carbon atoms, said hydrocarbon chains being saturated or partly unsaturated said film prepared by the method which comprises (I) sequentially mixing with about 450 to about 600 parts by weight of an organic solvent (A) about 3 to about 40

parts by weight of a pigment masterbatch prepared by high shear mixing at a temperature in the range of about 135° C. to about 190° C, 100 parts by weight of polyvinyl chloride resin with from about 10 to about 60 parts by weight of said plasticizer, from about 2 to about 6 parts by weight of said pigment, from about 1 to about 5 parts by weight of said stabilizer and from about 0.5 to about 3.0 parts by weight of said chelator, (B) 100 parts by weight of polyvinyl chloride resin and (C) about 2 to about 9 parts by weight of said surfactant, about 0.1 to about 1.0 parts by weight of the slip agent, about 0.1 to about 1.4 parts by weight of said chelator and about 18 to about 43 parts by weight of said plasticizer, (II) casting said mixture as a film, and (III) drying the cast film at a temperature in the range of about 25° C. to about 95° C.

4,057,673

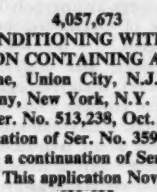
FABRIC CONDITIONING WITH IMPROVED COMPOSITION CONTAINING A PLASTICIZER

Pasquale J. Falivene, Union City, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 513,238, Oct. 9, 1974, abandoned, which is a continuation of Ser. No. 359,395, May 11, 1973, abandoned, which is a continuation of Ser. No. 82,461, Oct. 20, 1970, abandoned. This application Nov. 10, 1975, Ser. No. 630,605

Int. Cl.² B32B 5/16; B05D 3/12

U.S. Cl. 428—411 **2 Claims**



1. An article for conditioning fibrous materials by treating them with a conditioning composition which comprises a solid base, at least one side of said base coated with a continuous coating of a conditioning composition comprising a major proportion of nonionic, anionic or cationic surface active conditioning agent and from ½ to 25% by weight of conditioning composition of plasticizing agent selected from the group consisting of water soluble alkyl phenyl polyoxyethylene ethanols containing from 2 to 20 oxyethylene groups, the alkyl containing from 6 to 12 carbon atoms, water-soluble poly -(C_2 – C_3) - alkylene glycols having from 2 to 20 C_2 – C_3 alkoxy groups per molecule, lower alkyl polyols of 2 to 6 hydroxy groups per molecule and esterified dicarboxylic acid containing substantially terminally located carboxyl groups and an intermediate alkylene chain of from 4 to 10 carbon atoms, said acid being esterified with C_3 – C_{10} alcohol and wherein from 10 to 30% of the thickness of said composition penetrates said base said plasticizing agent improving the transferability of the conditioning agent to the fibrous materials by preventing cracking or flaking off of conditioning agent from the base during a conditioning operation in which the conditioning article is in control with tumbling fibrous materials for a time long enough to apply a sufficient amount of conditioning composition to such materials to condition them.

4,057,674

PROCESS FOR PREPARING DRY, LAMINATING IMPREGNATED PAPERS OR CLOTHS, AND PROCESS FOR PRODUCING DECORATIVE PLATES USING THE SAME

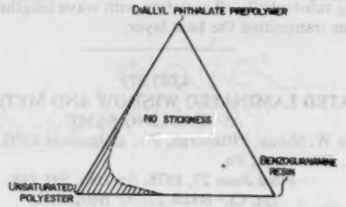
Ryuzo Nakatsuka, Yokohama; Kenji Saito, Fujieda, and Tadashi Kawamoto, Takatsuki, all of Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Continuation of Ser. No. 359,461, May 11, 1973, abandoned. This application Apr. 1, 1975, Ser. No. 564,060

Claims priority, application Japan, Nov. 2, 1972, 47-109398

Int. Cl.² B32B 27/06, 27/10; C09J 5/00

U.S. Cl. 428—481 **11 Claims**



1. A process for producing a dry, impregnated laminating paper or cloth comprising the steps of:

1. impregnating a paper or cloth with a solution of mixed resins in an organic solvent in one step, said resin solution comprising

a radical polymerization catalyst, a crosslinking monomer, optionally a releasing agent, and a ternary resin composition consisting of

A. 10 to 90% by weight of an organic solvent-soluble diallyl phthalate prepolymer having an average molecular weight of 2,000 to 20,000 and a softening point of 70° to 140° C., which prepolymer has been obtained by partially polymerizing a diallyl phthalate monomer and separating and purifying the resulting prepolymer, and

90 to 10% by weight, in total, of (B) an organic solvent-soluble non-crystalline unsaturated polyester and

C. an organic solvent-soluble benzoguanamine resin obtained by condensing in an alkaline reaction system 1 mole of benzoguanamine with 1 to 4 moles of formaldehyde, the weight ratio of (C)/(B) being up to 0.85 and the amount of (C) being at least 2% by weight of the total weight of (A), (B) and (C); and

(2) then drying the thus impregnated paper or cloth.

4,057,675

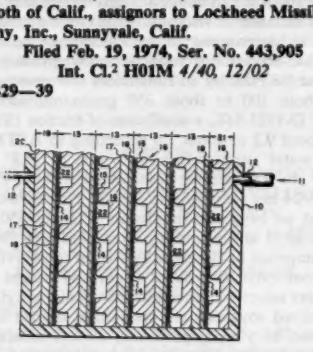
ELECTROCHEMICAL CELL

Harry J. Halberstadt, Los Altos, and Leroy S. Rowley, San Jose, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Feb. 19, 1974, Ser. No. 443,905

Int. Cl.² H01M 4/40, 12/02

U.S. Cl. 429—39 **1 Claim**



1. In a reactive metal anode-aqueous electrolyte electrochemical cell, a plurality of bipolar electrodes connected in

series, each bipolar electrode consisting of an open mesh electrically conducting cathode screen supported on a ribbed cathode backplate, said ribs forming continuous electrolyte channels between said cathode screen and said cathode backplate, and an alkali metal anode bonded to the reverse side of said cathode backplate, the surface of said anode being covered by a protective insulating film naturally formed on said anode in the presence of water, and means for maintaining anode-cathode contact between the plurality of electrodes as the anodes are consumed during operation of the cell.

4,057,676

CELL CONTAINING CARBON-FLUORINE COMPOUND CATHODE, ALKALI METAL ANODE AND SOLID HALO-ALUMINUM ALKALI METAL COMPOUND ELECTROLYTE

Bhaskara M. L. Rao, Fanwood, and Paul A. Malachesky, Berkeley Heights, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 4, 1977, Ser. No. 756,642
Int. Cl.² H01M *10/44*
U.S. Cl. 429—50 **13 Claims**

1. A current producing primary cell from which a current can be drawn at a temperature below the melting point of the electrolyte, comprising:

a. a cathode having a compound formed of fluorine and carbon;

b. an alkali metal-containing anode; and

c. a solid electrolyte consisting essentially of one or more compounds of the formula:

$$MAlX_4$$

wherein M is an alkali metal and X is one or more halogens selected from the group consisting of chlorine and bromine.

10. A method of operating a current-producing primary cell, comprising:

drawing a current from said cell at a temperature below the melting point of the electrolyte of said cell wherein said cell comprises a cathode having a compound formed of fluorine and carbon, an alkali metal-containing anode, and a solid electrolyte consisting essentially of one or more compounds of the formula:

$$MAlX_4$$

wherein M is an alkali metal and X is one or more halogens selected from the group consisting of chlorine and bromine.

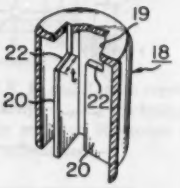
4,057,677

ADAPTER

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co., Ltd., Tokyo, Japan

Division of Ser. No. 467,305, May 6, 1974, Pat. No. 3,998,516. This application Dec. 31, 1975, Ser. No. 645,626
Claims priority, application Japan, May 6, 1974, 49-467305[U]
Int. Cl.² H01M *2/10*
U.S. Cl. 429—100 **2 Claims**

1. An adapter to enable a non-standard sized battery to be operatively placed in a battery compartment designed to house a standard sized battery which is larger than the non-standard size battery, said adapter comprising an elongated, molded plastic tubular body having a transverse wall integral with one end thereof and with an opening through said end wall, said tubular body having a shorter axial length than a non-standard sized battery whereby the non-standard sized battery extends outwardly of said tubular member when the non-standard sized battery is contained within said adapter, said tubular body further including a plurality of inwardly directed and axially extending resilient ribs formed integrally with said transverse end wall and the inside surface of said tubular body for releasably holding a portion of the non-standard sized battery contained within said adapter, each of said ribs including a notch extending axially from the inner surface of said transverse end wall and along at least a portion of the inwardly directed edge of said ribs, the opening in said transverse end



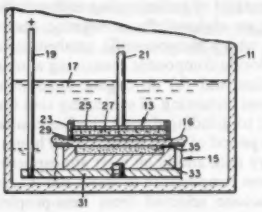
wall including a plurality of cuts therein that correspond to the shape and depth of each said notch in each said rib whereby the unnotched portion of each said rib contacts and resiliently retains the non-standard sized battery and whereby said adapter is capable of being manufactured by a molding process in a single operation utilizing cooperating male and female molds.

4,057,678

MOLTEN SALT BATTERY HAVING INORGANIC PAPER SEPARATOR

Robert D. Walker, Jr., Gainesville, Fla., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 16, 1977, Ser. No. 778,186
Int. Cl.² H01M *10/39*
U.S. Cl. 429—104 **10 Claims**



1. In a molten salt battery comprising an anode containing metallic lithium, a cathode containing a chalcogen or chalcogenide, a molten salt electrolyte containing lithium ions in contact with said anode and said cathode, and a porous separator disposed between said anode and cathode for providing electrical insulation and ionic transport between said anode and cathode, the improvement wherein said separator comprises a porous sheet comprising a homogeneous mixture of 2–20 wt.% chrysotile asbestos fibers and the remainder of said homogeneous mixture inorganic material non-reactive with the anode and the electrolyte.

4,057,679

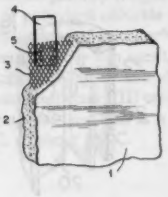
ORGANIC ELECTROLYTE BATTERIES

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 503,821, Sept. 6, 1974, Pat. No. 3,945,852. This application Jan. 2, 1976, Ser. No. 646,108
Int. Cl.² H01M *6/14*
U.S. Cl. 429—194 **5 Claims**

1. A high energy density cell comprising an anode electrode of an active light metal selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, beryllium,

and aluminum; an electrolyte salt of said light metals; an organic solvent having dissolved therein said electrolyte salt; an active cathode material selected from the group consisting of metal chromates, dichromates, oxides, halides, permanganates, arsenates, periodates, vanadates, persulfates, sulfites and mixtures thereof; and a cathode current collector in direct contact with said active cathode material; said current collector being composed of a material selected from the group consisting of the metals of Groups IV*b*, V*b*, and VI*b* of the Periodic Table and mixtures thereof.



4,057,680

METHOD OF POLYMERIZING α-OLEFINS

Isamu Yamazaki; Yoichi Toyama, both of Tokyo; Kiwami Hirota, Yokohama, and Hisashi Takeuchi, Tokyo, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 295,013, Oct. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 92,149, Nov. 23, 1970, abandoned. This application Aug. 10, 1976, Ser. No. 713,199

Claims priority, application Japan, Mar. 3, 1970, 45-17663; Nov. 26, 1969, 44-94256

Int. Cl.² C08F *4/66, 10/06*

U.S. Cl. 526—142 **2 Claims**

1. In a method of polymerizing alpha-olefins and styrene by contacting an alpha-olefin or styrene under polymerization conditions with a stereospecific catalyst comprising (a) a titanium trichloride component containing aluminum chloride as a solid solution and (b) an organo-aluminum compound, the improvement consisting of subjecting said titanium trichloride component to grinding during or after contact with a treating agent for a period of from about 5 to 50 hours in an impact, ball or vibratory mill, and in an inert atmosphere at a temperature of from room temperature to about 200° C., said treating agent being a lactone selected from beta-propiolactone, gamma-butyrolactone, gamma-valerolactone, gamma-nonalactone, epsilon-caprolactone, and coumarine, and said titanium trichloride being contacted with said treating agent so that 0.01–1 mol of said treating agent is incorporated in 1 mol of said titanium trichloride.

4,057,681

PROCESS FOR HOMOGENEOUSLY POLYMERIZED HIGH UNSATURATION C4–C10 ISOOLEFIN CONJUGATED DIENE COPOLYMERS

Martin L. Gorbaty, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 584,456, June 6, 1975, abandoned. This application Apr. 28, 1976, Ser. No. 681,326

Int. Cl.² C08F *2/06, 4/14, 4/52*

U.S. Cl. 526—185 **51 Claims**

1. In a solution polymerization process for preparing a substantially gel-free, high number average molecular weight, high unsaturation copolymer of a C_4–C_{10} isoolefin and at least one C_5–C_9 cyclic conjugated multiolefin wherein said copolymer contains about 5 to about 40 mole percent unsaturation and wherein the polymerization is performed by using as a catalyst a catalytic amount of either an aluminum halide dissolved in a polar solvent or a hydrocarbyl aluminum dihalide and wherein the polymerization is carried out at a temperature below −100° C., the improvement which comprises using a cosolvent in the amount of about 20 to about 40 volume percent based on the monomers plus cosolvent wherein the cosolvent comprises a blend of about 15 to about 90 volume percent of at least one C_5–C_8 cycloparaffin and about 85 to about 10 volume percent of at least one C_4–C_8 acyclic paraffin based on the total volume of cosolvent.

12. In a solution polymerization process for preparing a substantially gel-free, high number average molecular weight, high unsaturation copolymer of a C_4–C_{10} isoolefin, at least one C_5–C_{14} acyclic conjugated diolefin and at least one C_5–C_9 cyclic conjugated multiolefin wherein said copolymer contains about 5 to about 40 mole percent unsaturation and wherein the polymerization is performed by using as a catalyst a catalytic amount of either an aluminum halide dissolved in a polar solvent or a hydrocarbyl aluminum dihalide and wherein the polymerization is carried out at a temperature below −100° C., the improvement which comprises using a cosolvent in the amount of about 20 to about 40 volume percent based on the monomers plus cosolvent wherein the cosolvent comprises a blend of about 15 to about 90 volume percent of at least one C_5–C_8 cycloparaffin and about 85 to about 10 volume percent of at least one C_4–C_8 acyclic paraffin based on the total volume of cosolvent.

4,057,682

POLYMERIZATION OF α-PINENE

Erwin Richard Ruckel, Darien, and Long Shyong Wang, Stamford, both of Conn., assignors to Arizona Chemical Company, Wayne, N.J.

Filed Sept. 16, 1975, Ser. No. 613,777

Int. Cl.² C08F *4/58*

U.S. Cl. 526—190 **9 Claims**

1. A process for polymerizing alpha-pinene which comprises the steps of: establishing a catalyst system comprising (1) a mixture of (a) a minor amount of alkyl halide, alkenyl or aralkyl halide and (b) an alkyl germanium halide, alkyl germanium alkoxide or an aryl germanium halide and (2) a major amount of aluminum chloride or aluminum bromide or mixtures of the latter in an inert solvent, adding at a temperature between about minus 30° C. and about plus 30° C. alpha-pinene incrementally with agitation, adjusting and maintaining the temperature of the mixture at about minus 30° C. to about plus 30° C. for from about one to about four hours, quenching the latter mixture with an aqueous solution, separating aqueous phase from the hydrocarbon phase, and recovering a solid polymer therefrom.

4,057,683

GRAFT COPOLYMER AND PROCESS FOR MAKING SAME

Katherine Anne Cline Elting, Houston, Tex., assignor to Milchem Incorporated, Houston, Tex.

Filed Mar. 15, 1976, Ser. No. 667,176

Int. Cl.² C08F *289/00*; C08L *55/00*

U.S. Cl. 526—194 **133 Claims**

1. A process comprising polymerizing a monomeric compound containing a polymerizably reactive vinyl group in an aqueous medium at a pH not greater than about 3.5 in the presence of a ceric salt which is soluble in at least one component of said medium and an inorganic substrate having hydroxyl groups or which forms hydroxyl groups in said aqueous medium and which is capable of initiating polymerization of said monomeric compound, wherein said inorganic substrate is a reducing agent in said reaction.

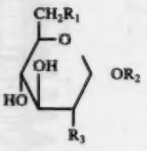
4,057,684

ALKYL AMINO-GLUCOPYRANOSIDE DERIVATIVE AND PROCESS FOR PRODUCING THE SAME

Goro Kimura, Kamakura, and Junzo Sekine, Tokyo, both of Japan, assignors to Tokyo Tanabe Company, Limited, Japan

Filed June 20, 1975, Ser. No. 588,893
Claims priority, application Japan, July 5, 1975, 50-76975
Int. Cl.[2] A61K *31/70*; C07H *15/04*
U.S. Cl. 536—4 11 Claims

1. An alkyl amino-glucopyranoside having the following formula:



[I]

in which R_1 is an N-carbamyl-N'-(2-chloroethyl)-N'-nitroso-amino group, $R_2$is an alkyl group having from 1 to 4 carbon atoms, and R_3 is an hydroxyl group or an N-carbamyl-N'-(2-chloro-ethyl)-N'-nitroso-amino group.

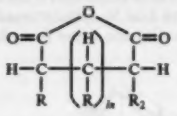
4,057,685

CHEMICALLY MODIFIED ENDOTOXIN IMMUNIZING AGENT

Floyd Cottam McIntire, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 223,012, Feb. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 147,686, May 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 20,834, March 18, 1970, abandoned, which is a continuation-in-part of Ser. No. 784,174, Dec. 16, 1968, abandoned. This application May 9, 1974, Ser. No. 468,624
Int. Cl.[2] C08B *37/00*
U.S. Cl. 536—18 2 Claims

1. A bacterial endotoxin derivative of reduced toxicity comprising a gram-negative bacterial lipoplysaccharide having at least one free amino group and an anhydride selected from the group consisting of compounds of the formula



wherein *n* is 0 or 1, and R, R_1 and R_2 each represent hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_3–C_6 cycloalkyl, phthalyl or methylphthalyl wherein any two R groups taken together form a saturated cyclic substituent.

4,057,686

SULPHONIC ACID SALTS OF S-ADENOSILMETHIONINE

Alberto Fiecchi, Milan, Italy, assignor to Bioresearch Limited, Milan, Italy

Filed July 9, 1975, Ser. No. 594,601
Claims priority, application Italy, July 12, 1974, 25128/74
Int. Cl.[2] C07H *19/16*
U.S. Cl. 536—26 23 Claims

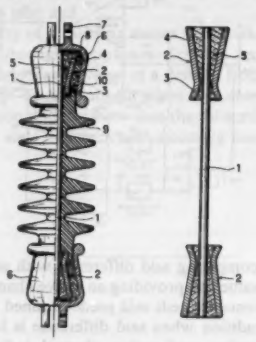
1. Stable salts of S-adenosil-L-methionine (SAM) with sulphonic acids selected from the group consisting of methanesulphonic, ethanesulphonic, 1-n-dodecanesulphonic, 1-n-octadecanesulphonic, 2-chloroethanesulphonic, 2-bromoethanesulphonic, 2-hydroxyethanesulphonic, 3-hydroxypropanesulphonic, d-,1-,d,1-10-camphorsulphonic, d-,1-,d,1-3-bromocamphor-10-sulphonic, cysteic, benzenesulphonic, p-chlorobenzenesulphonic, 2-mesitylbenzenesulphonic, 4-biphenylsulphonic, 1-naphthalenesulphonic, 2-naphthalenesulphonic, 5-sulphosalicylic, p-acetylbenzenesulphonic, 1,2-ethanedisulphonic, o-benzenedisulphonic and chondroitinesulphuric acids, and double salts of said acids with sulphuric acid.

4,057,687

CONNECTION BETWEEN CORE AND ARMATURES OF STRUCTURES COMPRISING A CORE OF AGGLOMERATED FIBRES

Michel Willem, Abrest, France, assignor to Ceraver, Paris, France

Filed Nov. 12, 1975, Ser. No. 631,276
Claims priority, application France, Nov. 25, 1974, 74.38589
Int. Cl.[2] H01B *17/12, 17/14;* F16B *7/02*
U.S. Cl. 174—179 5 Claims



1. In a structure for transmitting great mechanical stresses, comprising an elongated core including at least one agglomerated glass fibre rod and fixing armatures fitted to respective ends of the rod and wherein each fixing armature comprises means defining two end-to-end truncated conical surfaces which telescopingly receive an end of said rod and which flare outwardly, away from each other, said surfaces being of nozzle shape and forming a sealing recess within each fixing armature for the rod and having portions which taper on either side of an intermediate zone, said sealing recesses opening freely on their ends facing each other, and a sealing substance within each recess for sealing the gap between said rod and said conical surfaces and being capable of sliding on the conical surfaces when said rod is submitted to longitudinal force relative to said armatures.

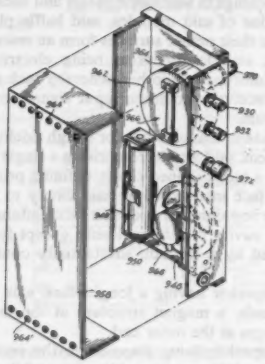
4,057,688

INTERCOM EMBODYING TAP TRANSDUCERS

Gerard J. O'Brien, deceased, late of Jersey City, N.J., and by Catherine H. O'Brien, executrix, 33 Pamrapo Ave., Jersey City, N.J. 07305

Continuation-in-part of Ser. No. 396,758, Sept. 13, 1973, Pat. No. 3,932,711. This application Jan. 12, 1976, Ser. No. 648,565
Int. Cl.[2] H04M *9/02*
U.S. Cl. 179—1 H 15 Claims

1. An intercom for transmitting electrical signals containing sound or speech information, the intercom comprising a housing at least a portion of which forms a soundboard sensitive to vibratory input; a pair of electrically conductive bearing means rigidly mounted on said soundboard and electrically insulated therefrom; a conductive switching bar extending between and loosely engaged in said bearing means, said switching bar being least mechanically stable or being in a state of least equilibrium when the axis thereof is in a substantially vertical orientation to provide optimum vibratory or switching characteristics; a source of electrical energy having one pole thereof connected to one of said bearing means; conversion means for converting the electrical signals into audible sound or speech, said conversion means having two input terminals one of which is connected to the other pole of said source of electrical energy and the other terminal of which is connected to the other of said bearing means, whereby said conductive switching bar, said source of electrical energy and said conversion means together form a series circuit; actuation means connected in said series circuit for selectively enabling and disabling the operation of said series circuit, a current flowing through said series circuit only in the enabled condition thereof, said current being converted into said electrical signals containing sound or speech information when said soundboard is exposed to sound or speech and said current is repeatedly interrupted to correspond to the vibratory characteristics of said sound or speech patterns due to the make and break conditions of said conductive



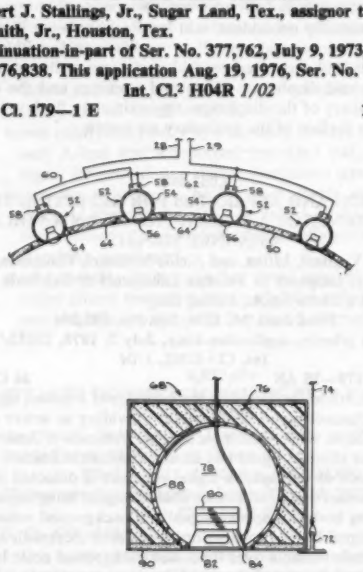
switching bar with relation to said bearing means; output terminal means connected to said circuit for transmitting said electrical signals to a remote location; and detection means for detecting when the axis of said switching bar substantially deviates from the vertical direction, whereby said electrical signals appearing at said output terminal means may be used to reliably produce sound or speech at the location or the intercom or to transmit the same to a remote location.

4,057,689

HIGH FIDELITY SOUND REPRODUCTION SYSTEM AND MODULES THEREOF

Robert J. Stallings, Jr., Sugar Land, Tex., assignor to Roy H. Smith, Jr., Houston, Tex.

Continuation-in-part of Ser. No. 377,762, July 9, 1973, Pat. No. 3,976,838. This application Aug. 19, 1976, Ser. No. 715,694
Int. Cl.[2] H04R *1/02*
U.S. Cl. 179—1 E 13 Claims



1. A high fidelity loudspeaker system comprising a multiplicity of modules each consisting essentially of a loudspeaker having a diaphragm and a magnet structure together with a member having a generally spherical cavity, said cavity being

truncated with a circular opening and the loudspeaker being secured to and supported by the member so that its diaphragm lies in and fills said circular opening while the magnet structure extends cantilever style into the generally spherical cavity, in combination with a number of baffle plates having openings therein to receive and support said modules with said diaphragms disposed in said openings and essentially flush with the outer surface of said baffle plate, there being a like multiplicity of openings in said baffle plates and each such opening supporting one of said modules, said baffle plates being disposed so that their nether surfaces form an essentially continuous surface, said loudspeakers being electrically interconnected to reinforce one another, whereby each speaker may be utilized to receive a common input signal covering the full audio spectrum.

5. An article of manufacture for a high fidelity sound reproduction system, said article comprising a single dynamic loudspeaker and a block-shaped cavity-defining primary enclosure having one face intersected by said cavity to define a single opening, the remaining area of said face defining a rigid baffle surface, the cavity in said enclosure except for said opening being defined by a smooth, substantially continuous curved surface,

said loudspeaker having a longitudinal axis with inner and outer ends, a magnet structure at the inner end and a diaphragm at the outer end,

said loudspeaker being disposed in the enclosure with its magnet and disposed in said cavity and its diaphragm end supported by the enclosure to fill and close said opening.

13. In a high fidelity sound reproduction system, the combination of

A. a dynamic loudspeaker having a longitudinal axis with inner and outer ends, a magnet disposed at the inner end and a single membrane diaphragm at the outer end,

B. a primary enclosure defining a substantially unvented concave cavity and having an opening to said cavity, said cavity being defined by a substantially continuous curved surface, and

C. an outwardly convex secondary enclosure or baffle plate also having an opening therethrough of substantially the same size as the opening in said primary enclosure, said enclosures being secured together with said openings substantially coincident, said loudspeaker being disposed with its inner end extending cantilever style within said cavity and supported on said enclosures at its outer end with said diaphragm filling said openings and the outer periphery of the diaphragm approximately flush with the outer surface of the secondary enclosure.

4,057,690

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF A SPEECH SIGNAL ON A VOICE CHANNEL SIGNAL

Federico Vagliani, Milan, and Alcide Molinari, Vimercate, both of Italy, assignors to Telettra Laboratori di Telefonia Elettronica e Radio S.p.A., Milan, Italy

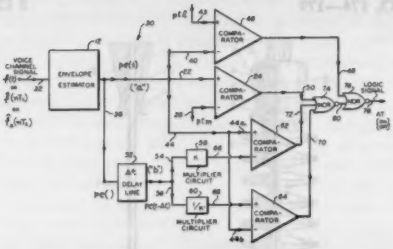
Filed June 24, 1976, Ser. No. 699,364

Claims priority, application Italy, July 3, 1975, 25053/75

Int. Cl.[2] G10L *1/04*

U.S. Cl. 179—15 AS **34 Claims**

14. A method for detecting the presence of a speech signal in a voice channel signal, said method providing an active channel indication when said speech signal presence is detected in said voice channel signal and an idle channel indication when the absence of said speech signal presence is detected in said voice channel signal, said voice channel signal being capable of containing both said speech signal and background noise, said speech signal having an envelope associated therewith having a magnitude variable over time, said background noise having an envelope associated therewith having a magnitude substantially constant over time, said voice channel signal having an envelope associated therewith having a magnitude dependent on said magnitudes of said speech signal and said background noise envelopes; said method comprising the steps of making a first evaluation of said voice channel signal envelope magnitude over a first time domain to obtain a first resultant output signal, making a second evaluation of said voice channel signal envelope magnitude over a second time domain to obtain a second resultant output signal, said second time domain being different from said first domain, determining the difference in magnitude between said first and second evaluation resultant



output signals, comparing said difference with at least a first predetermined value and providing an active channel conditon when said difference exceeds said predetermined value and an idle channel condition when said difference is less than said predetermined value, said active channel indication being provided when said active channel condition is present, said idle channel indication being provided when said idle channel condition is present.

4,057,691

SWITCHING NETWORK WITH CROSSTALK ELIMINATION CAPABILITY

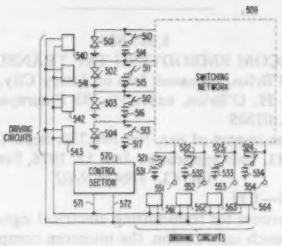
Hirokazu Goto, and Kunio Nagashima, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed June 23, 1976, Ser. No. 699,131

Claims priority, application Japan, June 24, 1975, 50-78936; Dec. 24, 1975, 50-155411; Dec. 24, 1975, 50-155412

Int. Cl.[2] H04Q *3/52*

U.S. Cl. 179—18 GF **6 Claims**



1. A switching network comprising:

a group of incoming lines connected to telephone subscribers;

a group of outgoing lines intersecting said incoming line group;

a plurality of switching elements provided at preselected crosspoints formed between these incoming lines and outgoing lines for interconnecting a desired incoming line in said incoming line group and a desired outgoing line in said outgoing line group in response to a call from a subscriber;

a plurality of ON-state detectors connected to the respective incoming lines for detecting the ON-state of said switching elements in response to variation of current or voltage;

a plurality of direct current isolating circuits connected to said respective incoming lines for preventing direct cur-

rents from flowing between the subscribers and said incoming lines;

a plurality of OFF-hook detectors connected to these direct isolating circuits for detecting the OFF-hook state of the subscribers;

a plurality of decision circuits responsive to output signals on said ON-state detectors and output signals of said OFF-hook detectors for determining the state where the subscribers are in the ON-hook state where each incoming line is idle; and

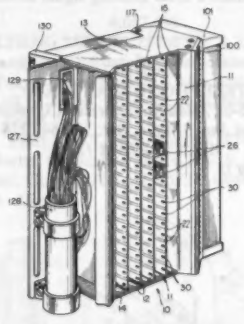
a plurality of grounding means for grounding said incoming lines through impedance elements having a sufficiently low impedance value at a desired frequency band of signals to be exchanged when the output signals of said decision circuits show that the subscribers are in the ON-hook state and each said incoming line is idle.

4,057,692

PROTECTOR APPARATUS FOR TELECOMMUNICATIONS LINES

George DeBortoli, and Detlef Zimmermann, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 27, 1976, Ser. No. 736,173
Int. Cl.² H04M *3/22*
U.S. Cl. 179—98 **9 Claims**



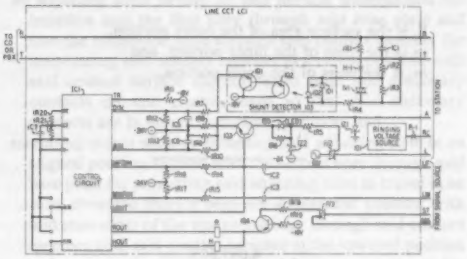
1. Protector apparatus for telecommunication lines, comprising a metal housing, a plurality of metal portions extending between opposed sides of said housing to provide a plurality of columnar spaces, formations on said metal columnar partitions, said formations spaced at regular predetermined positions to define a plurality of protector positions in each columnar space, an insulating back member in said housing, a plurality of terminals extending through said back member, at least four terminals for each protector position, each of said terminals including a part for connection to protectors in said protector position, and a part for connection of a conductor, said housing of elongated form, said partitions extending longitudinally of said housing, whereby said protector positions are provided in vertical columns and horizontal rows, said partitions including formations at each protector position for cooperating with detent means on said protectors to provide predetermined partial withdrawal positions for said protectors.

4,057,693

LOGIC CONTROL FOR ELECTRONIC KEY TELEPHONE LINE CIRCUIT

Ronald Joseph Angner, Freehold, N.J.; Marion Lee Blount, Palo Alto, Calif., and James Volney Lacy, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1976, Ser. No. 708,857
Int. Cl.² H04M *1/72*
U.S. Cl. 179—99 **9 Claims**



1. A line circuit for use in a key telephone system for controlling the hold function between a switching machine and at least one telephone station, said line circuit adapted for A-lead control between said line circuit and said station, said hold control circuit comprising

means for providing a momentary station transition signal whenever any of said telephone stations makes a transition from an on-hook to off-hook condition or from an off-hook to an on-hook condition,

means for detecting the presence or absence of a signal on said A-lead,

means for establishing first and second timed intervals where said second timed interval is longer than said first timed interval,

means for recording any provided circuit transition signal for a period of time determined by said established first timed interval,

means for recording a subsequently provided station transition signal for a period of time determined by said established second timed interval,

means controlled jointly by a detected absence of a signal on said A-lead and a recorded provided station transition signal for providing a station disconnect signal,

means for providing a hold bridge enable signal upon a detected absence of a signal on said A-lead and a concurrent absence of a recorded subsequently provided station transition signal, and

means operable during said first timed interval when a provided circuit transition is recorded for reducing said second timed interval to said first timed interval.

4,057,694

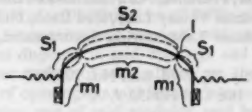
SPEAKER DIAPHRAGM HAVING FLAT RESPONSE CURVE

Akio Obuchi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 21, 1976, Ser. No. 734,691
Claims priority, application Japan, Oct. 23, 1975, 50-126858
Int. Cl.² H04R *9/06*
U.S. Cl. 179—115.5 R **6 Claims**

1. In a audio speaker including a diaphragm having concentric, contiguous inner and outer portions, said diaphragm being adapted to vibrate in a split mode wherein the interface between said inner and outer portions is defined by a nodal circle, and a voice coil operatively associated with one of said portions, the improvement characterized by:

the nodal circle being positioned such that the ratio $S_i : S_o$ is approximately equal to the ratio $m_i : m_o$, where
S_i is the surface area of the inner portion,



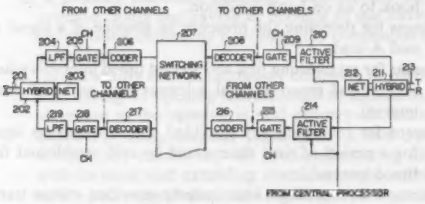
S_o is the surface area of the outer portion,
m_i is the mass of the inner portion, and
m_o is the mass of the outer portion.

4,057,695

TELECOMMUNICATION SYSTEM WITH CONTROLLED GAIN ACTIVE FILTERS

Toru Ohno, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed May 12, 1976, Ser. No. 685,809
Claims priority, application Japan, May 14, 1975, 50-56067
Int. Cl.² H04B *3/36*
U.S. Cl. 179—170 R **6 Claims**



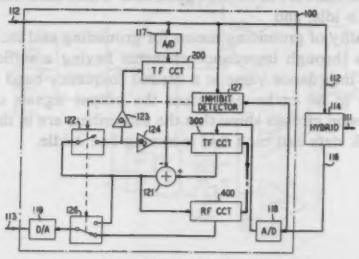
1. A telecommunication system comprising:
a first pulse code modulation coder for converting voice-frequency signals into pulse code modulation signals;
a time division multiplex pulse code modulation switching network having one side thereof connected to said coder and switching said pulse code modulation signals from said coder through the network to the opposite side thereof;
a first pulse code modulation decoder connected to said one side of said switching network and converting pulse code modulation signals switched through said network from the opposite side thereof into voice-frequency signals;
a plurality of transmission lines over which voice-frequency signals are transmitted;
a plurality of respective active filters coupling the output of said first decoder and the input of said first coder to said transmission lines;
a plurality of subscriber's lines connected with the opposite side of said switching network, through a second pulse code modulation decoder and a second pulse code modulation coder, respectively; and
central processing means, connected with said plurality of subscriber's lines and said switching network, for effecting selective connections through said network, between said subscriber's lines and said transmission lines, and being connected to said active filters for controlling the gain of each of said respective active filters in accordance with characteristics of said subscriber's lines.

4,057,696

RECURSIVE-LIKE ADAPTIVE ECHO CANCELLER

Richard Dennis Gitlin, Monmouth Beach, and John Stewart Thompson, Tinton Falls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1976, Ser. No. 712,518
Int. Cl.² H04B *3/20*
U.S. Cl. 179—170.2 **15 Claims**



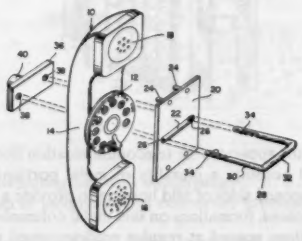
1. An echo canceller of the type having a transversal filter means for synthesizing from an input signal on a receiving signal path a replica signal to approximate an echo signal on a sending signal path for subtraction from the echo signal, means for subtracting the replica signal from the echo signal to produce a residual echo signal, said transversal filter means responsive to the residual echo signal for changing the replica signal to reduce the residual echo signal, said canceller further comprising first adaptive signal processing means responsive to the residual echo signal for modifying the echo signal on said sensing signal path before the subtraction, and second adaptive signal processing means coupled to receive the residual echo signal and responsive to said first adaptive processing means for providing an operation inverse to that of said first processing means to produce a clear sending signal essentially free of the echo signal.

4,057,697

TELEPHONE DIAL LOCK

Marie Addoo, 135-01 234th St., Laurelton, Queens, N.Y. 11422

Filed Jan. 7, 1976, Ser. No. 647,214
Int. Cl.² H04M *1/66*
U.S. Cl. 179—189 D **1 Claim**



1. A telephone dial lock apparatus for preventing unauthorized use for making outgoing calls of a telephone instrument of the type having a dialing mechanism in the handle member of the handset comprising:
a rectangular shield plate having two broad faces adapted to covering and obscuring said dialing mechanism;
first and second spaced-apart holes in said shield plate, the spacing between said holes being greater than the lateral dimension of said handle member;
a groove in one face of said shield plate extending between said first and second spaced-apart holes;
a generally U-shaped shackle, the cross member of said

U-shaped shackle being substantially straight and the spacing between the legs of said U-shaped shackle being substantially equal to the spacing between said first and second spaced-apart holes in said shield plate;

the legs of said U-shaped shackle being inserted through the first and second spaced-apart holes in said shackle and the straight cross member of said U-shaped shackle nesting within said groove;

a plurality of support pins extending from the face of said shield plate opposite to the face containing the groove;

said support pins being adapted to rest upon the inner surface of the handle portion of said handset adjacent to said dialing mechanism whereby said shield plate is supported from and in close proximity to said dialing mechanism;

said legs being long enough to extend substantially past the handle member of said handset when said U-shaped shackle is inserted fully into said shield plate and said shield plate is placed adjacent to said dialing mechanism with said two legs straddling said handle member;

ratchet indentations on the portion of facing sides of the legs of said U-shaped shackle which extends past said handle member, said ratchet indentations being inclined toward the closed end of the U;

a lock plate having two spaced-apart holes therethrough, the spaced-apart holes in said lock plate having diameter and spacing adapted to the passage therethrough of said two legs;

spring loaded dogs in said lock plate adapted to oneway engagement with the ratchet indentations in said two legs, whereby said lock plate can be pressed onto said two legs without the use of a key;

said lock plate, spring-loaded dogs and ratchet indentations being adapted to resist the disassembly thereof;

a barrel type lock for use with a cooperating key in said lock plate; and

said barrel type lock being adapted to releasing of said spring loaded dogs from engagement with said ratchet indentations when said key is operated in said barrel type lock.

4,057,698

SWITCHING MECHANISM OF A TIMEPIECE

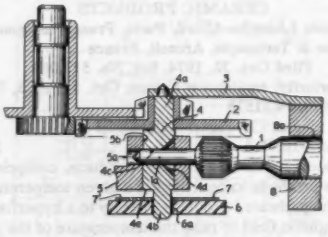
Yasuichi Nakagawa, Kashiwa; Masataka Ikenishi, Soka; Yoshio Hozumi, Tokyo; Shozo Kushida, Chiba, and Koichi Tsukutani, Matsudo, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Apr. 7, 1976, Ser. No. 674,844

Claims priority, application Japan, Apr. 8, 1975, 50-47192[U]

Int. Cl.² H01H *3/32, 15/24;* G04C *3/00*

U.S. Cl. 200—16 A **3 Claims**



1. A switching mechanism for a timepiece, comprising:

a base plate having a first bore extending therethrough and having a second bore extending therethrough and intersecting said first bore;

a circuit board having a surface opposite said second bore and having stationary contacts mounted on said surface opposite said second bore;

a contact member dimensioned to slidably fit within the second bore of said base plate and having an axial dimension aligned with said second bore, said contact member having a transverse bore extending therethrough and alignable with the first bore through said base plate, and said contact member having a conductive lower end portion extending from said base plate and terminating at a contact surface for contacting said stationary contacts on said circuit board to complete an electrical connection therebetween;

biasing means comprising a spring for biasing said contact member downwardly to a lowered position with said contact surface contacting said stationary contacts on said circuit board;

an adjusting stem having an end portion dimensioned for insertion into the first bore through said base plate and into the transverse bore through said contact member for maintaining said contact member at a raised position with said contact surface thereof raised from said stationary contacts on said circuit board so that said stationary contacts are in an unconnected condition; and

mounting means slidably mounting said adjusting stem in an aligned position aligned with the second bore through said base plate for permitting said adjusting stem to travel in an axial direction thereof between a retracted position with said stem clear of the transverse bore through said contact member with said contact member at the lowered position and an operative position with said stem inserted into the first bore of said base plate and into the transverse bore of said contact member to maintain said contact member in the raised position, and wherein said contact member and said stem together include means for raising said contact member from the lowered to the raised position as said stem travels from the retracted to the operative position.

4,057,699

DENSITY CONTROL MONITOR WITH OPPOSING BELLOWS

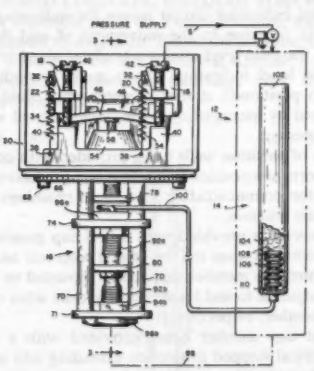
Robert D. Reis, Hingham, Mass., assignor to United Electric Controls Company, Watertown, Mass.

Continuation of Ser. No. 459,462, April 10, 1974, abandoned.

This application Jan. 9, 1976, Ser. No. 648,042

Int. Cl.² H01H *35/32*

U.S. Cl. 200—83 D **6 Claims**



1. The combination with a chamber filled with a gaseous medium at a predetermined temperature and pressure, of switch means, switch controlled means operable to supply a gaseous medium to the chamber and monitoring means for controlling operation of the switch to maintain the chamber filled with said gaseous medium at said predetermined temperature and pressure, said monitoring means comprising reciprocably movable pressure-responsive means, overriding means operable by said pressure-responsive means, said overriding means being interposed between the pressure-responsive means and said switch for effecting operation of the switch, a sensing element in the chamber, said sensing element compris-

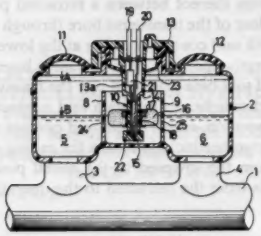
ing a sealed tube containing a gaseous medium at the same temperature and pressure as that in the chamber, displaceable means in the sealed tube responsive to a change in pressure therein, means responsive to the displacement of the displaceable means in the sealed tube to move the pressure-responsive means proportionately in one direction and conductor means connecting the chamber to the pressure-responsive means for transmitting a change of pressure within the chamber to the pressure-responsive means to move it proportionately in the opposite direction.

4,057,700

FLUID LEVEL INDICATOR

Katsushi Nakashima, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 20, 1976, Ser. No. 659,936
Claims priority, application Japan, Feb. 21, 1975, 50-22289
Int. Cl.[2] H01H *35/18*
U.S. Cl. 200—84 C **2 Claims**



1. A fluid level indicator for a reservoir of a brake tandem master cylinder, comprising:

a pair of vertically extending partition walls provided within said reservoir and defining three chambers;

float means disposed within the middle chamber defined by said partition walls, said float means being reciprocated in response to changes in the level of the brake fluid within said chamber;

fluid level indicating circuit means for indicating the fluid level in response to the movement of said float means when the fluid level attains a predetermined level;

said fluid level indicating circuit means including a reed switch positioned at said predetermined fluid level and actuated by means of a magnet incorporated within said float means;

said pair of partition walls being provided with communication bores at a position just below said predetermined fluid level for communicating said three chambers with one another; wherein,

said reservoir is provided with a first cap member detachably mounted upon the top of said reservoir and a second and third cap member detachably mounted to said reservoir adjacent to and located on opposite sides of said first cap member, respectively;

said first cap member being provided with a dependent cylindrical stepped projection extending into said middle chamber of said reservoir;

said fluid level indicating circuit means being disposed within said projection of said first cap member;

said float means is slidably engaged with said projection of said first cap member;

said projection of said first cap member is provided with two shoulder portions between which said float means is movable; and,

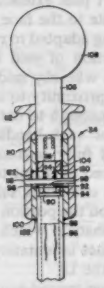
said partition walls are formed integrally with said reservoir and extending vertically upwardly from the bottom of said reservoir and displaced from the top of said reservoir so as to form an opening which connects said three chambers.

4,057,701

CONTROL LEVER

Robert Michael Sisk, and Lary Lynn Williams, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 9, 1976, Ser. No. 712,606
Int. Cl.[2] H01H *9/06*
U.S. Cl. 200—213 **6 Claims**



1. In a control mechanism including a control lever incorporating an electric switch whereby selective actuations of functions controlled by movement of the lever and operation of the switch may be accomplished without requiring the operator to move his hands from the lever, the improvement comprising: said lever defining a hand grip at one end thereof; a switch actuator including a sleeve slidably mounted on the lever adjacent to and for movement toward and away from the hand grip and including a finger grip; said lever being provided with a transverse opening elongated in the direction of movement of said sleeve; a pin extending through the opening and fixed to said sleeve for movement therewith; said lever including a hollow section traversed by said pin; a switch supported in said hollow section by the lever and including an actuator element located in the path of movement of the pin and biased in the direction of the hand grip toward a first position for effecting a closed condition in the switch; biasing means acting between the lever and the switch actuator for urging the latter in a direction away from the hand grip to a normal position wherein it holds the actuator element in a second position for effecting an open condition in the switch.

4,057,702

PROCESS AND PLANT FOR THE FRITTING OF CERAMIC PRODUCTS

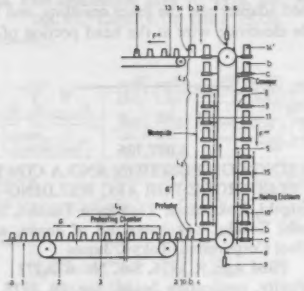
Jean Francois Lacombe-Allard, Paris, France, assignor to Automatisme & Technique, Arcueil, France

Filed Oct. 22, 1974, Ser. No. 517,069
Claims priority, application France, Oct. 31, 1973, 73.38987; Sept. 18, 1974, 74.31573
Int. Cl.[2] H05B *9/06*; C04B *35/64*
U.S. Cl. 219—10.55 A **3 Claims**

1. A process for fritting ceramic products, comprising preheating the products to be fritted at a given temperature, then exposing the preheated products directly to a hyperfrequential electro-magnetic field to raise the temperature of the products high enough to cause fritting of the products, and protecting the products during said fritting against losses by radiation and against thermal shocks, the maximum temperature of the protective means being less than the fritting temperature.

3. A plant for fritting ceramic products, comprising a preheating furnace heated by electrical resistance, a conveyor for carrying said products through the furnace, a waveguide downstream from the furnace, conveying means for receiving the preheated articles from the furnace conveyor and carrying them through said waveguide, a station at the inlet of the waveguide where said preheated products are provided with protectors, said conveying means including fritting bearers for

the products and protectors traveling through the waveguide, means for subjecting said products in the waveguide to microwave heating to raise them to fritting temperature, a station at the outlet of the waveguide where said protectors are removed from the fritted products and returned to said fritting bearers,



and a controlled temperature enclosure, said conveying means including an endless conveyor chain supporting said fritting bearers for carrying the protectors through said waveguide and then through said enclosure after they leave said last-mentioned station.

4,057,703

METHOD OF MACHINING BY EROSIVE ELECTRICAL DISCHARGES

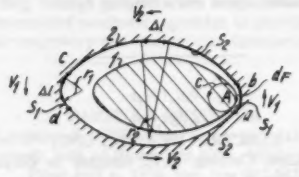
Jean Pfau, Geneva, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

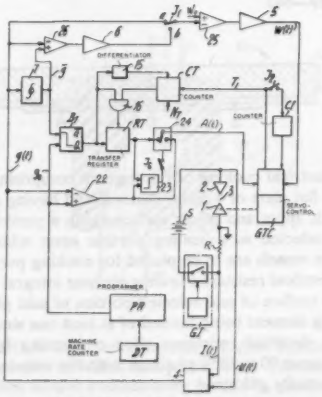
Filed Nov. 12, 1975, Ser. No. 630,959

Claims priority, application Switzerland, Nov. 14, 1974, 15183/74

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 C **13 Claims**





1. In a process for machining a surface of an electrode workpiece by electrical discharges initiated and supplied with current by a succession of voltage pulses applied to a machining zone across a machining gap between an electrode tool and said electrode workpiece according to which a relative displacement between said electrodes is achieved along a cyclic translation movement following a closed path inscribed in a surface of predetermined shape and in such a manner as to decrease the gap between said electrodes on a portion of the machines surface and to produce a cyclic displacement of the machining zone, the improvement comprising varying the speed of said translation movement so as to remove for all the machined surface of the workpiece the same quantity of material per unit area during at least one cycle of translation.

9. An apparatus for machining a surface of an electrode workpiece by electrical discharges initiated and supplied with current by a succession of voltage pulses applied to a machining zone across a machining gap between an electrode tool and said electrode workpiece according to which a relative displacement between said electrodes is achieved along a cyclic translation movement following a closed path inscribed in a surface of predetermined shape and in such a manner as to decrease the gap between said electrodes on a portion of the machined surface and to produce a cyclic displacement of the machining zone, said apparatus comprising means for varying the relative displacement of the electrode tool and electrode workpiece according to a cyclic translation movement along a predetermined path, means for controlling the speed with which said cyclic translation movement is effected, said last mentioned means being responsive to a first electrical value, and means for modifying said electrical value as a function of the variation between a second electrical value representing the machining gap and the machining current and a reference value, wherein said first electrical value comprises two different electrical values one corresponding to the maximum speed of translation movement and the other corresponding to the minimum speed of translation movement, further comprising means for selecting one of said different electrical values, said last mentioned means responding as a function of the difference between said second electrical value and said reference value.

4,057,704

GAS SHIELDED ARC WELDING TORCH

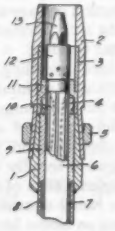
Ewald Geus, Blasbach, and Vesa Tammi, Giessen, both of Germany, assignors to Alexander Binzel Corporation, Germany

Filed Nov. 26, 1975, Ser. No. 635,339

Claims priority, application Germany, Nov. 29, 1974, 2456478; Sept. 24, 1975, 2542470

Int. Cl.² B23K *9/32*

U.S. Cl. 219—75 **12 Claims**



1. The combination comprising a welding torch including a current and coolant carrying torch tube and cable assembly with a coolant receiving gas nozzle seat affixed thereto at one end thereof, a gas nozzle, said nozzle seat having a conically shaped outer diameter surface portion decreasing towards an end of the nozzle seat opposite the torch tube and cable assembly, said nozzle having an attachment end with an inner cylindrical wall received directly around the nozzle seat and in direct contact therewith, said attachment end having expan-

sion slits, the angle of inclination of said outer surface portion and the inner diameter of said inner cylindrical wall of said attachment end being such that said attachment when seated is in a stressed, expanded condition on the nozzle seat and in substantially complete contact with said seat, and a constricting ring received around said nozzle and effective to increase the contact pressure between said seat and said attachment end.

4,057,705

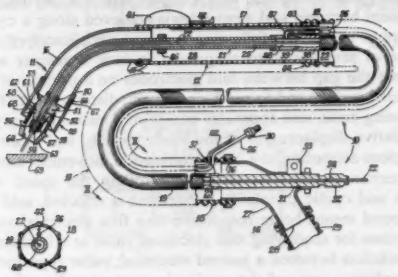
FUME EXTRACTING WELDING GUN

Herbert D. Cockrum, and Charles E. Kater, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 412,454, Nov. 2, 1973. This application Apr. 9, 1975, Ser. No. 566,599

Int. Cl.² B23K *9/00*

U.S. Cl. 219—130 **3 Claims**



1. A fume extracting welding gun, through which a consumable electrode wire is fed, comprising:

a head portion having a tubular housing, an inner conduit, and a distal end thereof;

a control handle portion having a tubular sheath connected to the tubular housing, said inner conduit being disposed within the tubular sheath;

a flexible connector portion having a flexible outer tube, a flexible inner conduit, and a proximal end, said flexible outer tube being connected to the tubular sheath and said flexible inner conduit being connected to the inner conduit;

first positioning means extending inwardly from the tubular housing for concentrically maintaining the inner conduit within the head portion and defining a first annular fume extraction passageway;

second positioning means extending inwardly from the tubular sheath for concentrically maintaining the inner conduit within the control handle portion and defining a second annular fume extraction passageway, said second positioning means including a clip extending between the tubular sheath and the inner conduit;

third positioning means extending from the flexible outer tube for concentrically maintaining the flexible inner conduit within the flexible connector portion at the proximal end and defining a third annular fume extraction passageway, said first, second and third annular fume extraction passageways serially extending fully between said distal and proximal ends of the gun and having substantially common radial dimensions, said third positioning means including an elbow having a wire feed adapter, a cylindrical inlet and a cylindrical outlet, said wire feed adapter being connected to the flexible inner conduit, said cylindrical inlet being connected to the flexible outer tube, and said cylindrical outlet extending angularly outwardly from said wire feed adapter;

suction means in communication with said cylindrical outlet and the third fume extraction passageway for moving fumes from the distal end of the head portion, through the fume extraction passageways and outwardly from the gun;

means for conducting the consumable electrode wire through said wire feed adapter, said flexible inner conduit, and said inner condunits said inner conduit and said wire defining an annular shielding gas passageway;

means for conducting a shielding gas into the gun, through the annular shielding gas passageway and outwardly from the distal end of the head portion; and

means for conducting electricity into the gun, through said wire feed adapter and the inner conduits, and to the consumable electrode wire at the head portion of the gun.

4,057,706

COATING COMPOSITION AND A COATED ELECTRODE FOR ARC WELDING

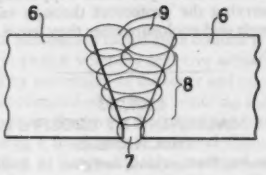
Takashi Tanigaki, Yokohama; Yoshikazu Tanaka, Sagamihara, and Takeshi Koshio, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 9, 1976, Ser. No. 675,271

Claims priority, application Japan, Apr. 18, 1975, 50-46547

Int. Cl.² B23K *35/22*

U.S. Cl. 219—146 **4 Claims**



1. A coating composition for a welding electrode comprising 35 to 55% $CaCO_3$, 1 to 8% Fe_2O_3, 1 to 7% CaF_2, with the ratio of Fe_2O_3 to CaF_2 being from 0.4 to 1.6, 1 to 5% Mn, 4 to 9% Si and 2 to 9% Ni with the balance being a slag forming agent, an arc stabilization agent and a binding agent.

4,057,707

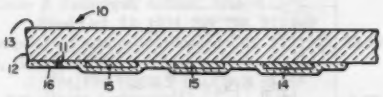
ELECTRIC HEATING UNIT

Richard E. Allen, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,419

Int. Cl.² H05B *3/16*

U.S. Cl. 219—543 **6 Claims**



1. An electrical cooking or heating unit comprising;

I. a thin flat plate of a glassy material and having relatively smooth upper and lower surfaces with a portion of said plate selected as a heating portion upon whose upper surface vessels are to be placed for cooking purposes;

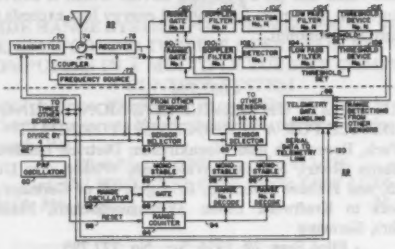
II. an electrical resistance heating element integral with said lower surface of said selected portion of said plate, such heating element being formed of at least one sinuous strip of an electrical resistance alloy comprising by weight from about 90 to 98% platinum with the remainder being substantially gold; and

III. a porous and partially sintered glaze covering said heating element and integral with such element and said lower surface of said selected portion of said plate.

4,057,708
MINIMUM MISS DISTANCE VECTOR MEASURING SYSTEM

Ashford C. Greeley, Scottsdale, and Sam M. Daniel, Tempe, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 565,514, April 7, 1975, abandoned. This application May 10, 1976, Ser. No. 684,594
Int. Cl.[2] G01S *9/04;* G06F *15/58*
U.S. Cl. 235—413 20 Claims



1. A system for measuring the minimum miss distance vector of a missile from a target comprising:

a plurality of sensor means mounted on the target in predetermined locations for sensing ranges to the missile, said sensor means producing range data;

synchronize means for sequentially operating said sensor means, for converting said sensed ranges to a digital form, and for associating with said digital data additional digital data identifying from which of said plurality of sensor means the digital range data is derived;

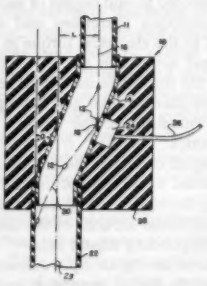
means for transmitting said range data and said identifying data corresponding to said range data; and

data processing means for receiving and processing said range data and for associating with said range data additional corresponding time and predetermined data corresponding to said sensor means locations according to a predetermined nonlinear algorithm to provide the desired missile trajectory and vector miss distance information.

4,057,709
PARTICLE DETECTOR

Joergen Lyngsgaard, 4755 Dover Road, and Ariel Stiebel, 88 Marlborough, both of Bloomfield Hills, Mich. 48013

Filed July 6, 1976, Ser. No. 702,843
Int. Cl.[2] B65G *51/36*
U.S. Cl. 235—92 PK 13 Claims

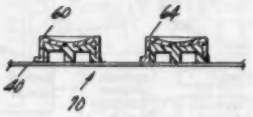


1. A particle detector comprising a first tubular conduit having an outlet to which said particles are translated one by one, said first tubular conduit being made of a shock absorbing material, a second tubular conduit having an inlet connected to the outlet of said first conduit and an outlet, said second tubular conduit being made of a hard resounding material and being disposed with its longitudinal axis at an angle to the trajectory of said particles for causing said particles to impact upon a wall of said second tubular conduit, a third tubular conduit made of shock absorbing material having an input connected to the output of said second tubular conduit, and an impact transducer affixed to the exterior of the wall of said second tubular conduit proximate to the area of impact of said particles for providing an electrical signal for each impact of a particle on said wall.

4,057,710
KEYBOARD ASSEMBLY

Arthur S. Willmott, 59 E. 2nd St., Mineola, N.Y. 11501

Filed Mar. 29, 1976, Ser. No. 671,179
Int. Cl.[2] G06C *7/02*
U.S. Cl. 235—145 R 2 Claims

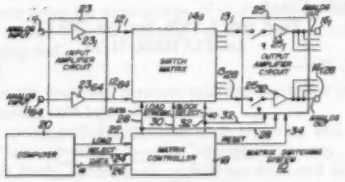


1. A method of making a keyboard assembly in which a sheet of thin flexible plastic film is bonded to a series of key portions arranged in a predetermined order, comprising the steps of molding a first series of key portions in a first mold, placing said first series of key portions into a second mold, introducing said film into said second mold, and then molding a second series of key portions underlying said first series of key portions to bond said film to said first key portions in said mold, said first series of key portions being provided with first runners extending between the key portions inwardly of said first series of key portions, and said second series of key portions being provided with runners outwardly of said second series of key portions, breaking away said first runners from said first series of key portions without breaking the bond between said film and said key portions.

4,057,711
ANALOG SWITCHING SYSTEM WITH FAN-OUT

Abhaya Asthana, Long Branch, and George Hannauer, E. Windsor, both of N.J., assignors to Electronic Associates, Inc., Long Branch, N.J.

Filed Mar. 17, 1976, Ser. No. 667,960
Int. Cl.[2] G06J *1/00*
U.S. Cl. 364—600 25 Claims



1. An analog switching system having fan-out for switching each of a plurality of analog signal sources to one or more predetermined analog signal destinations comprising

a three stage switch matrix including a plurality of input, middle and output switch blocks each having input and output terminals,

each switch block including a plurality of analog switch means with each analog switch means having an associated latching means, said plurality of latching means being adapted for coupling any one input terminal of a switch block to any one or more of the output terminals of

that block, each switch block having a high input impedance operational amplifier associated with each analog switch means,

control means coupled to each of said switch blocks for addressing each switch block and actuating at least one of said latching means to provide a connection assignment for at least one of said analog switch means.

4,057,712

METHOD AND APPARATUS FOR DISPLAYING BRAKE STOPPING DISTANCE OF A VEHICLE

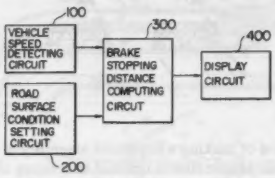
Yasuyuki Sakakibara, Okazaki, and Akira Kuno, Nagoya, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed July 23, 1976, Ser. No. 708,083

Claims priority, application Japan, Sept. 23, 1975, 50-115213

Int. Cl.[2] B60Q *1/00*; G06G *7/78*

U.S. Cl. 364—426.2 **6 Claims**



1. A brake stopping distance displaying apparatus for a vehicle comprising:

a vehicle speed detecting circuit for generating a signal corresponding to the running speed of a running vehicle;

a setting circuit presettable as desired in response to the surface conditions of a road on which said vehicle is running for generating a signal corresponding to a preset friction coefficient of said road surface;

a computing circuit connected to said vehicle speed detecting circuit and said setting circuit for generating from the signals therefrom a signal corresponding to a brake stopping distance which is proportional to the square of said running speed and inversely proportional to said friction coefficient; and

a display circuit connected to said computing circuit for responding to the signal from said computing circuit to display a result of said computation of the brake stopping distance.

4,057,713

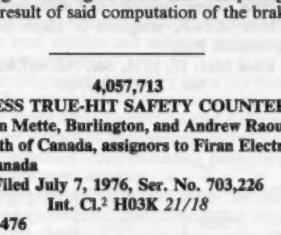
PRESS TRUE-HIT SAFETY COUNTER

Klaus Hermann Mette, Burlington, and Andrew Raoul St. Denis, Windsor, both of Canada, assignors to Firan Electronics, Inc., Oakville, Canada

Filed July 7, 1976, Ser. No. 703,226

Int. Cl.[2] H03K *21/18*

U.S. Cl. 364—476 **17 Claims**



1. A workpiece counter for a power press having a press bed and a reciprocating ram powered by a flywheel through a clutch and crankshaft with said flywheel being powered by a rotary power source, said workpiece counter comprising (a) means for calculating the energy of the flywheel and associated moving components based on the rotational speed of the flywheel for small increments of each revolution thereof, (b) means for calculating any energy loss of the flywheel between small increments of each revolution of the crankshaft, (c) means for determining the maximum incremental energy loss during each revolution of the crankshaft, (d) means for comparing said maximum incremental energy loss against a predetermined value and (e) a counting device which is activated each time said maximum incremental energy loss exceeds said predetermined amount.

4,057,714

DURABILITY OR SERVICE-LIFE MONITORING DEVICE FOR A TURBOGENERATOR SHAFT

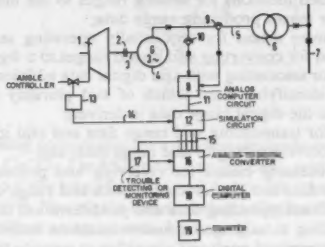
Kurt Fork, Rosenbach near Neunkirchen; Dietrich Lambrecht, Mulheim (Ruhr); Hermann Waldmann, Wieher near Uttenreuth, and Helmut Hofmann, Erlangen, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Sept. 29, 1976, Ser. No. 727,795

Claims priority, application Germany, Sept. 30, 1975, 2543587

Int. Cl.[2] G01L *3/00*; G01M *15/00*; G06F *15/20*

U.S. Cl. 264—494 **4 Claims**



1. Device for monitoring the service life of the shaft of a turbine-generator set comprising an analog computer circuit having a pair of inputs and an output,

means for feeding to the inputs of said analog computer circuit electrical quantities proportional to the voltage and the current of the generator, said analog computer circuit having means for converting said electrical quantities that are proportional to said generator voltage and current to an electrical quantity proportional to the electrical torque in the air gap of the generator, a simulation circuit having an input connected to said output of said analog computer circuit for receiving therefrom said electrical quantity proportional to the electrical torque in the air gap of the generator, said simulation circuit comprising means for determining the torques in individual sections of the shaft of the turbine-generator set and having a multiplicity of outputs corresponding to the number of individual sections of the shaft,

an analog-to-digital converter having an output and having inputs connected to said outputs of said simulation circuit for receiving therefrom analog data corresponding to the torques in individual sections of the shaft and converting them to corresponding digital data,

a digital computer having an input connected to said output of said analog-to-digital converter and connected therethrough to said simulation circuit,

a trouble-monitoring device connected parallel to said analog-to-digital converter, and having means for restricting said analog-to-digital converter to feed said digital data through said output thereof to said input of said digital computer only if a torque of extreme value is present in a section of the shaft,

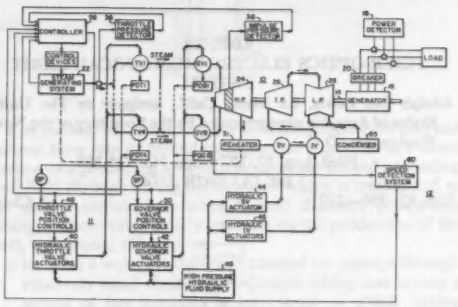
said digital computer having means for converting said digital data into signals proportional to the service life of the shaft.

4,057,715

WIDE RANGE SYSTEM FOR TRANSFERRING STEAM GENERATOR AND TURBINE OPERATION BETWEEN COMPUTERS IN A MULTIPLE TURBINE COMPUTER CONTROL SYSTEM

Donald J. Jones, Pittsburgh, Pa., and Guy E. Davis, Martinez, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1973, Ser. No. 413,276
Int. Cl.[2] F01D *17/02*; G05B *15/00*; G06F *15/06*
U.S. Cl. 364—494 34 Claims



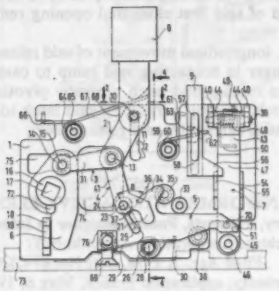
1. A control system for an electric power plant having at least one steam turbine and a steam generator, said control system comprising multiple digital computers including at least a first digital computer and a second digital computer, means for generating input signals representating predetermined process variables associated with said steam generator, means for generating input signals representing turbine speed and other predetermined process variables associated with said steam turbine, means for coupling the input signals to both of said computers, each of said computers including means for sequentially controlling its programmed operation and substantially identical means for generating control outputs for operating at least predetermined startup valves of said steam generator and throttle and governor valves of said steam turbine as a function of the input signals, means for sensing predetermined control system malfunctions, said control output generating means including a speed control for operating said turbine valves in response to a speed reference and a representation of the actual speed during turbine acceleration to synchronous speed, said control output generating means further including a steam generator startup valve control for operating the steam generator startup valves to control at least working fluid pressure at a predetermined process point, means for coupling the outputs of one of said computers to operate the steam generator startup valves and the turbine valves, means for substantially conforming the structure of the other computer to the structure of said one computer in real time including means for generating control outputs in the other computer substantially equal to those from said one computer, and means for smoothly executing a transfer in the control of the steam generator startup valves and the speed loop control of the turbine from said one computer to said other computer when said sensing means detects a control system malfunction during steam generator or turbine startup.

4,057,716

CIRCUIT BREAKER TRIP AND RELEASE TYPE CONTROL MECHANISM

Paul Canonne, and Gérard Neumann, both of Barentin, France, assignors to Societe d'Appareillage Electrique Saparel, Saint Marcellin, France

Filed Oct. 15, 1975, Ser. No. 622,795
Claims priority, application France, Oct. 16, 1974, 74.34781
Int. Cl.[2] H01H *3/32*
U.S. Cl. 200—153 H 9 Claims



1. In a trip and release type control mechanism comprising:
two laterally spaced bed-plates,
a main connecting rod,
aligned elongated openings within flanges,
an axle projecting through said openings and extending between said bed-plates and being articulated to one end of said main connecting rod,
a trip knob articulated to said axle for movement therewith along with said main connecting rod,
a secondary connecting rod,
a retaining connecting rod,
said secondary connecting rod being articulated on one end with the other end of said main connecting rod and being commonly articulated to one end of said retaining connecting rod,
said elongated openings comprising at one end a notch into which said axle falls when the control mechanism is in trip position,
a control cam, said control cam being articulated to the other end of said retaining connecting rod, said control cam comprising two cylindrical shoulders, a through hole drilled within said cylindrical shoulders for inserting a control shaft, said control cam being mounted for pivoting about said cylindrical shoulder,
a pin mounted to said retaining connecting rod at a point remote from the articulation of said retaining connecting rod to said main connecting rod and said secondary connecting rod,
a latch,
a pivot pin spanning between said bed-plates for pivotably mounting said latch therebetween,
a first spring coiled about said latch pin pivot and pressing said latch in release position against a first stop,
a roller freely rotatable about said pin mounted to said retaining connecting rod on an edges of said latch,
the improvement comprising:
second elongated openings within said bed-plates for receiving respective ends of the pin to which said roller is mounted,
a release lever pivotably mounted at one end of said bed-plates at a position intermediate of said bed-plates and having at an opposite end facing the side of said latch, a catch stop fixed to the end of said release lever facing the side of said latch, said release lever comprising at least one ramp intermediate of said catch stop and said release lever pivot axis, said release lever extending parallel to said

bed-plates and normally contacting said latch at a position above said catch stop,

a second spring for biasing said release lever into contact with the side of said latch,

a release knob mounted adjacent said release lever for movement along the side of said release lever and comprising a finger for contact with said at least one ramp to force said release lever to pivot against the bias of said second spring means away from the side of said latch to release said latch, and

a third spring for biasing said trip knob to raised position at the end of said first elongated opening remote from said notch;

whereby, longitudinal movement of said release knob causes said finger in contacting said ramp to cause said release knob to release said latch whereby pivoting away from said latch, thereby permitting said latch to ride over the catch stop carried by said release lever.

4,057,717

TRANSFORMER WITH ACTIVE ELEMENTS

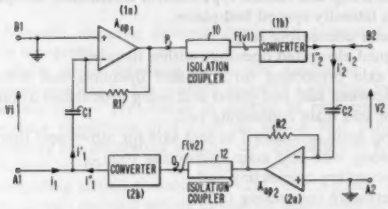
Michel Ferry, Vallauris, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,339

Claims priority, application France, May 6, 1975, 75.15087

Int. Cl.² G06G 7/62; H03H 7/06

U.S. Cl. 364—802 **7 Claims**



1. An active transformer of the type which includes two primary terminals to which is applied a voltage v_1 with a current i_1, and two secondary terminals supplying a voltage v_2 with a current i_2 when connected to a load circuit, said transformer comprising:

a first circuit whose input, connected to said primary terminals, generates an input current of the form $i_1' = jC_1\omega v_1$ and whose output supplies a current of the form $i_2'' = -jN\omega v_1$ at said secondary terminals;

a second circuit whose input, connected to said secondary terminals, generates an input current of the form $i_2' = jC_2\omega v_2$, and whose output supplies a current $i_1'' = -jN\omega v_2$ at said primary terminals;

the terms C_1, C_2 and N being respectively the dual equivalents of the terms L_1, L_2 and M found in relations associated with a conventional transformer, and said currents satisfying the relations $i_1 = i_1' - i_1''$ and $i_2 = i_2' - i_2''$.

4,057,718

ARRANGEMENT FOR SUPPORTING LIGHTING FITTINGS AND THE LIKE

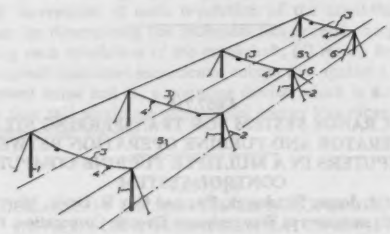
Lars David Svensson, Vikingavagen 112, Taby, Sweden (S-183 43)

Filed May 13, 1976, Ser. No. 685,789

Int. Cl.² F21V 21/00; H02G 7/20

U.S. Cl. 362—249 **9 Claims**

1. An arrangement for suspending lighting fittings or the like comprising a system of standards erected along a traffic-route or like area including a plurality of standards in at least one row having one or more intermediate individual standards between individual standards at opposite ends of the row and a continuous line system including means stringing lighting fittings mounted on top of said systems of standards, each intermediate standard of said system of standards being individually releasable from said means and disconnected from said line system when such an intermediate standard is moved



downwardly; said line system being retained substantially in a horizontal plane above the traffic-route by other standards of said system of standards despite failure of an intermediate individual standard.

4,057,719

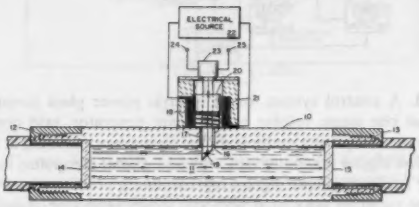
FIBER OPTICS ELECTRO-MECHANICAL LIGHT SWITCH

Adolph Lee Lewis, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1976, Ser. No. 718,285

Int. Cl.² G02B 5/14

U.S. Cl. 250—227 **7 Claims**



1. An electro-mechanically operated light switch for transferring light energy relative to a fiber optic light transmission path comprising:

a body member having a cylindrical bore of substantially optical smoothness and configured to receive a fiber optic terminal at each end;

a window fabricated of material substantially transparent to the wavelengths of light energy transmitted by said fiber optic light transmission path and supported at each end of said body member contiguous to each said fiber optic terminal;

a liquid material substantially filling said cylindrical bore between said windows and having an index of refraction higher than said body member for sustaining substantially total internal reflection along the optical axis of said cylindrical bore;

a port in said body member disposed transversely relative to said optical axis;

a transparent member movably mounted in said port and resiliently supported relative to said body member for extending into said liquid material;

said transparent member having an angularly disposed reflective end for redirecting light energy when extended into said liquid material;

a ferromagnetic element affixed to said transparent member;

an electrically conductive coil supported on said body member for electromagnetic flux linkage with said ferromagnetic member; and

a source of electrical energy adapted to be selectively connected to said electrically conductive coil.

4,057,720

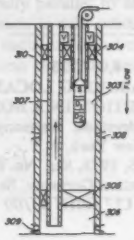
BEHIND CASING FLUID FLOW DETECTION IN PRODUCING WELLS USING GAS LIFT

Hans J. Paap, and Dan M. Arnold, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,171

Int. Cl.² G01V *5/00*

U.S. Cl. 250—266 **23 Claims**



1. A method for measuring the direction, linear flow rate and volume flow rate of behind casing water migration in a cased portion of a producing well operating on gas lift and producing well fluid through casing perforations which is transmitted to the earth's surface in relatively small diameter production tubing, without substantially interrupting the production of the well, comprising the steps of:

a. locating a well tool sized and adapted for passage through relatively small diameter production tubing and having a source of fast neutrons at least some of which having sufficient energy to cause the nuclear reaction O^{16} (n,p) N^{16} and at least two gamma ray detectors longitudinally spaced from said source and each other to a position adjacent above or below the producing perforations to be investigated by passing said tool through the production tubing while keeping the well on production;

b. repetitively irradiating the borehole environs with bursts of fast neutrons from said source;

c. detecting substantially between said neutron bursts at each of said detectors gamma rays primarily caused by the decay of the unstable isotope N^{16} and generating signals representative thereof; and

d. combining said signals according to a predetermined relationship to derive an indication of the direction and linear flow rate of any elemental oxygen nuclei comprising undesired fluid flow in a preferred direction behind the well casing at said adjacent position.

4,057,721

OIL POLLUTION MONITORING AND MONITORING UNIT

Raymond Michael deVial, Beckenham, and Philip Maurice Taylor, Croydon, both of England, assignors to Bailey Meter & Controls Limited, England

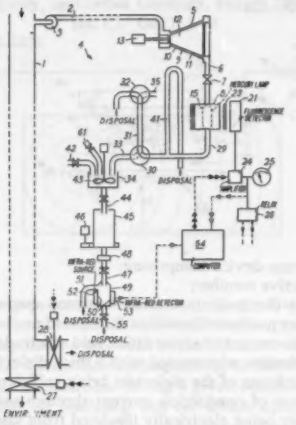
Filed May 10, 1976, Ser. No. 684,838

Claims priority, application United Kingdom, May 8, 1975, 19359/75

Int. Cl.² G01T *1/169*

U.S. Cl. 250—301 **6 Claims**

1. A method of continuously monitoring a water stream in respect of its contamination content of oil, including continuously exciting fluorescent radiation in the stream as it passes a monitoring point and producing a continuous monitoring indication dependent upon a measure of the amount of fluorescent radiation so excited, recurrently withdrawing from the stream discrete samples of the contaminated water and making by an infra-red absorption procedure respective determinations of the degree of contamination of said samples by oil, each infra-red absorption procedure comprising adding to the sample a solvent for the oil, separating out from the water of the sample a solution of the oil in the solvent and measuring the infra-red absorption capability of the percentage of oil in the solution,



and recurrently recalibrating or correcting the monitoring indicating in dependence upon respective comparisons between the determinations and those monitoring indications that pertained to the respective moving parts of the stream from which the respective discrete samples were withdrawn.

4,057,722

METHOD AND APPARATUS FOR THE GENERATION OF DISTORTION-FREE IMAGES WITH ELECTRON MICROSCOPE

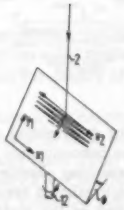
Eduard Hieke, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 20, 1976, Ser. No. 724,620

Claims priority, application Germany, Sept. 25, 1975, 2542812; Apr. 20, 1976, 2617159

Int. Cl.² H01J *37/28*

U.S. Cl. 250—311 **10 Claims**

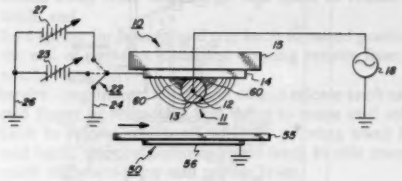


2. A method for the production of undistorted images of an inclined specimen in a scanning electron microscope comprising the steps of rotating the scanning raster of the scanning beam through an angle calculated from the angle of inclination and the working distance between said specimen and said microscope, and rotating said specimen until the scanning line direction and the direction of advance of scanning become aligned with two generally orthogonal directions on the surface of said specimen.

4,057,723
COMPACT CORONA CHARGING DEVICE

Dror Sarid, and Brian E. Springett, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 23, 1976, Ser. No. 651,769
Int. Cl.[2] H05F 3/04; H01J 1/14
U.S. Cl. 250—326 24 Claims

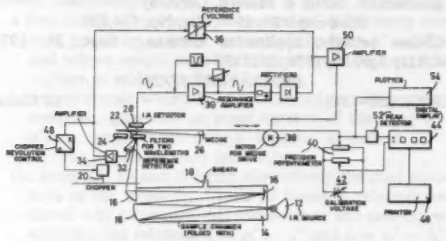


1. A corona device comprising:
a conductive member;
a corona electrode in contact with or spaced from said member no more than about 0.15 cm to produce exponential-like current characteristics, said electrode comprising a conductive wire coated with a thick dielectric material, the thickness of the dielectric being sufficient to prevent the flow of conduction current through said wire, said member being electrically insulated from said wire, and
means for applying an a.c. corona generating voltage to said wire to establish a corona discharge at the surface of said electrode and means for applying a d.c. reference potential to said member.

4,057,724
DETERMINATION OF THE ALCOHOL CONTENT OF BLOOD

Werner Karl Adrian, Im Roth 19, Ettlingen, Germany, and Robert Frank Borkenstein, 821 S. High St., Bloomington, Ind. 47401

Filed Mar. 17, 1976, Ser. No. 667,847
Claims priority, application Germany, Mar. 17, 1975, 2511771
Int. Cl.[2] G01N 21/26
U.S. Cl. 250—343 5 Claims

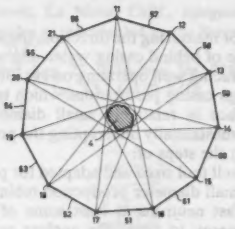


1. An arrangement for determining the alcohol content of blood by measuring the concentration of alcohol in exhaled breath, comprising a measuring chamber, an inlet on the measuring chamber by which exhaled breath can be blown in, a radiation inlet at one end of the measuring chamber and a radiation outlet at the other end of the measuring chamber, a radiation source in the form of a wide band thermal radiator located upstream of the radiation inlet, an interrupting device in the path of the beam, a filter having a pass band at 3.46 μm arranged as a tuned receiver downstream of the radiation outlet of the measuring chamber, a first photo-electric detector arranged beyond the filter, a second detector arranged in the path of the beam beyond the radiation outlet of the measuring chamber and in front of the filter, an amplifier connected to the output of the first detector, reference voltage source connected to the output of the second detector, a differential amplifier connected to both the output of the amplifier and the output of the reference voltage source, a drive motor connected to the output of the differential amplifier, an absorption device which is displaceable in and at right angles to the path of the beam between the radiation outlet of the measuring chamber and the photo-electric detector, the absorption device being in the form of a wedge connected to the drive motor and having absorption in the band width of the filter, the drive motor being adapted to automatically displace the wedge to maintain at zero the voltage at the output of the differential amplifier and an indicator which is connected to the drive motor for the wedge and arranged to indicate the position of the wedge in the path of the beam.

4,057,725
DEVICE FOR MEASURING LOCAL RADIATION ABSORPTION IN A BODY

Wolfgang Wagner, Norderstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,616
Claims priority, application Germany, Sept. 6, 1974, 2442809
Int. Cl.[2] G01N 23/00
U.S. Cl. 250—360 3 Claims

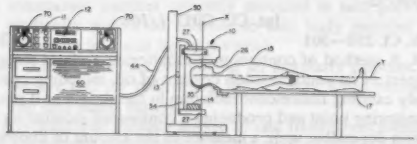


1. A device for measuring the spatial distribution of radiation absorption in a body, comprising:
a multiplicity of radiators regularly distributed about a circle of diameter sufficient to surround said body, each radiator emitting a wedge-shaped beam of radiation in the plane of said circle toward a different arc portion of said circle between two other radiators; and
a multiplicity of adjoining detectors in each of said different arc portions of said circle to measure radiation from the associated radiator emitting radiation thereto, each detector having only a comparatively small effective measuring field, the spatial distribution being calculated from the measured radiation values from said detectors.

4,057,726
COLLIMATOR TRANS-AXIAL TOMOGRAPHIC SCINTILLATION CAMERA

Ronald J. Jaszczak, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 22, 1975, Ser. No. 643,256
Int. Cl.[2] G01T 1/20, 1/166
U.S. Cl. 250—363 S 14 Claims



1. In a scintillation camera system in which a scintillation camera detector is arranged to precess in an orbit about a

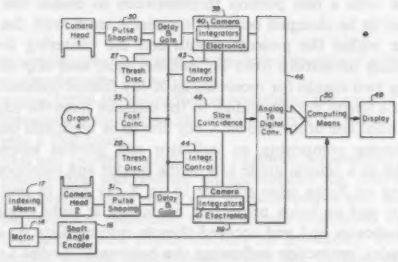
patient and facing said patient which orbit defines a transverse plane perpendicular to a cranial-caudal axis of said patient, and including indexing means for continuously advancing said detector in said orbit and for initiating and terminating radiation counting intervals at incremental arcs in said orbit, and computation means for processing the radiation counts detected and accumulated through each of said arcs to produce a representation of radioactive distribution in the plane defined by said orbit, and visual display means for displaying an image of said representation, the improvement comprising a collimator attached to said detector and interposed between said detector and said patient and having first shielding means defining highly radiation absorbent septa positioned to lie in straight lines generally parallel to said cranial-caudal axis as said detector precesses in said orbit, and a second shielding means defining less radiation absorbent septa in configurations the loci of which form closed curves parallel to the aforesaid orbit.

4,057,727

POSITRON IMAGING SYSTEM WITH IMPROVED COUNT RATE AND TOMOGRAPHIC CAPABILITY

Gerd Muehllehner, Mount Prospect, and Michael P. Buchin, Schaumburg, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Oct. 22, 1976, Ser. No. 734,797
Int. Cl.² G01T *1/164, 1/20*
U.S. Cl. 250—363 S **11 Claims**



1. In a positron imaging system with improved count rate capability for detecting the radioactive distribution of positron events within an organ of interest of a living subject, and including scintillation detectors producing electrical signals in response to said events, electronic means for processing said electrical signals and for supplying image reconstruction signals to a display means to produce an image of said radioactive distribution, the improvement comprising:

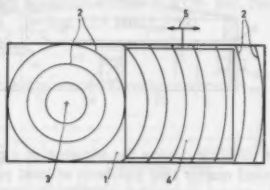
a pair of Anger-type scintillation cameras as said scintillation detectors, each camera having a unitary planar scintillation crystal, said crystal being greater than one-half inch in thickness, said cameras being respectively positioned on opposite sides of said organ; and pulse shaping means for reducing the pulse duration below approxmatley 900 nanoseconds, and for reducing the integration time of said pulse below approximately 500 nanoseconds, whereby the count rate capability and counting statistics of the system is improved for greater image quality and processing speed.

4,057,728

X-RAY EXPOSURE DEVICE COMPRISING A GAS-FILLED CHAMBER

Kristian Peschmann; Hans-Georg Junginger, both of Aachen, and Hans-Jürgen Hirsch, Tuddern, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 6, 1976, Ser. No. 655,754
Claims priority, application Germany, Feb. 7, 1975, 2505173
Int. Cl.² G01T *1/18*
U.S. Cl. 250—374 **4 Claims**



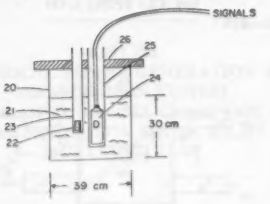
1. An X-ray exposure device comprising a flat and plane rectangular chamber filled with an ionizable gas, electrode structures disposed on the walls of the chamber which generate a potential distribution corresponding to that of two concentric spherical electrodes having a given central axis during operation, and an insulating foil on which charge carriers resulting from ionization of the gas by X-radiation are incident and displaceable in the longitudinal direction within the chamber for producing a latent charge image thereon.

4,057,729

MEASUREMENT OF SLURRY CONSISTENCIES

John Stringer Hewitt, 89 Nymark Ave., Willowdale-Toronto, Ontario, Canada

Filed Feb. 6, 1976, Ser. No. 655,722
Int. Cl.² G01T *3/00*
U.S. Cl. 250—390 **4 Claims**



1. A process for determining the consistency of a hydrogenous slurry containing not more than about 15% by weight of suspended material, and the density of the suspended material, which comprises:

immersing in the slurry a fast neutron emitting source; causing the fast neutrons to slow down, diffuse and be absorbed by the slurry upon travel within the slurry;

immersing in the slurry a first neutron detector at a predetermined distance of from 1–8 cm. from the fast neutron emitting source, and a second neutron detector at a predetermined distance of from 12–20 cm. from the neutron source;

counting and recording the neutrons detected by said first and second neutron detectors at their respective predetermined locations in the slurry;

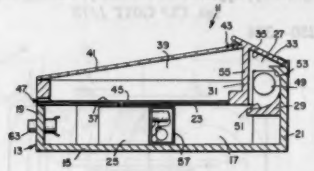
determining the slurry consistency and density of the suspended material from the neutron counts recorded at said locations in the slurry.

4,057,730

CHART VIEWER

George E. Dane, 1546 21st St., Manhattan Beach, Calif. 90266

Filed Apr. 23, 1976, Ser. No. 679,724
Int. Cl.² G01N *21/38*
U.S. Cl. 250—461 R 20 Claims



1. A chart viewing device for viewing in a darkened environment printed matter that has been at least partially treated with a long wave ultraviolet-sensitive fluorescent material, comprising:

a housing having an upper portion and a lower chart-supporting portion viewable from above said upper portion of said housing;

illumination means including a long wave ultraviolet light source disposed in said housing for illuminating the upper surface of said chart-supporting portion of said housing; and

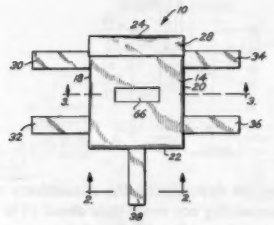
filter means including a U-V filter mounted at the top of said upper portion of said housing for allowing the viewing of long wave ultraviolet light-stimulated fluorescent light produced within said housing, and for essentially preventing the transmission therethrough of ultraviolet light energy.

4,057,731

STERILE CONTAINER FOR X-RAY CASSETTE HOLDERS

Herbert S. Loseff, 308 Woodley Road, Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 613,531, Sept. 15, 1975, abandoned. This application Jan. 5, 1977, Ser. No. 756,918
Int. Cl.² H05G *1/00*
U.S. Cl. 250—475 7 Claims



1. An improved sterile container for receiving and completely enclosing a non-sterile x-ray cassette holder so as to avoid the contamination of a sterile operative field by the non-sterile x-ray cassette holder when the x-ray cassette holder is utilized to take x-rays in the sterile operative field during surgery, the improved sterile container comprising:

a pair of relatively flexible walls, each having an inside surface, an outside surface, side edges, a bottom edge and a top edge and each being arranged so that their inside surfaces face each other, with the bottom and side edges of one of the flexible walls being aligned and connected with the corresponding bottom and side edges of the other flexible wall so as to form a container having closed sides and a closed bottom end and with the top edges of the flexible walls being adjacent to each other so as to define a top end which may be selectively opened or closed and which when opened is adapted to receive an x-ray cassette holder for insertion into the interior of the container;

sterile fastening means for permitting the container having an x-ray cassette holder disposed therein to be selectively secured to a patient while an x-ray is being taken, the said sterile fastening means serving to position the x-ray cassette relative to the patient and to maintain the patient relative to the x-ray cassette during the x-ray exposure, and

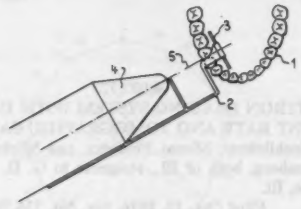
means for selectively holding the top end of the container closed so as to enclose an x-ray cassette holder within the container.

4,057,732

FILM HOLDER FOR BITE-WING RADIOGRAPHS

Rolf Marcus Klauser, Luzernerstrasse 6, 6010 Kriens, Switzerland

Filed Feb. 4, 1976, Ser. No. 655,434
Int. Cl.² G03B *41/16*
U.S. Cl. 250—479 3 Claims



1. A film holder for bite-wing radiographs comprising an elongate centering device having at one end a resilient clip device with a bite portion therebetween to enable the bite portion to be clamped between a patients teeth with the clip device within the patients mouth and the centering device extending outwardly from the patients face, said clip device having two shanks for receiving an X-ray film of optional size and of a length corresponding to the distance from the edge to the medial line of the widest X-ray film to be used; said centering device comprising an indicator rod portion extending parallel to a central guide axis of the holder and provided for guiding an X-ray cone relative to an X-ray film in said clip device; and an index projection extending at right angles to said indicator rod and secured thereto intermediate its ends; and index projection indicating the horizontal medial axis of the X-ray film and its end indicating the position of the central axis; said holder being integrally formed of plastic material.

4,057,733

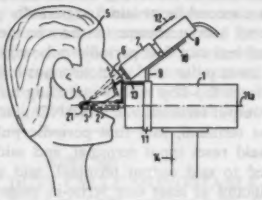
DENTAL X-RAY DIAGNOSTIC INSTALLATION

Dieter Hofmockel, Erlangen; Ulrich Grassmé, Nurnberg; Johannes Seissl, Erlangen-Buckenhof, and Ernst Otto Fleer, Bensheim-Auerbach, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 11, 1976, Ser. No. 657,296
Claims priority, application Germany, Feb. 17, 1975, 2506630
Int. Cl.² G03B *41/16*
U.S. Cl. 250—491 16 Claims

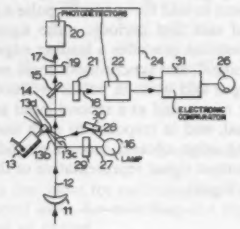
1. In a dental X-ray diagnostic installation, an X-ray tube arranged within a housing; and said X-ray tube having an anode for insertion into the mouth of a patient, the improvement comprising: an X-ray image intensifier for receiving

radiation from said X-ray tube, said X-ray image intensifier having an input screen; and means extending between the



X-ray tube and image intensifier for aligning said input screen with the focus of said X-ray tube.

4,057,734
SPECTROSCOPIC APPARATUS WITH BALANCED DUAL DETECTORS
Anthony Rene Barringer, Willowdale, Canada, assignor to Barringer Research Limited, Rexdale, Canada
Filed Aug. 28, 1975, Ser. No. 606,131
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—575 **15 Claims**



1. Spectroscopic apparatus for analyzing spectra of predetermined wavelengths, comprising:

a. means for receiving radiation containing the spectra to be measured from a first source and for forming the radiation into a first beam,

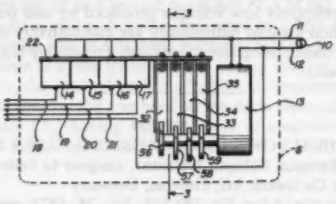
b. first and second photoelectric channels respectively comprising first and second photodetectors for converting radiation incident upon said photodetectors into electric currents and electronic circuit means connected to said first and second photodetectors for producing first and second signals which respectively are proportional in amplitude to the intensity of the radiation shining on said first and second photodetectors, said first photodetector being positioned to receive a first portion of radiation in said beam, said first portion constituting a measuring beam, and said second photodetector being positioned to receive a second portion of radiation in said beam, said second portion constituting a reference beam, said measuring beam containing the spectra to be measured and said reference beam containing spectral components of wavelengths such that comparison of the intensity of the measuring and reference beams provides a measure of the intensity of said spectra,

c. means optically coupled to a reference source of radiation for producing a second beam of radiation,

d. means operable cyclically for sequentially exposing said first and second photodetectors simultaneously to radiation in said first beam, and exposing said first and second photodetectors simultaneously to radiation in said second beam, and

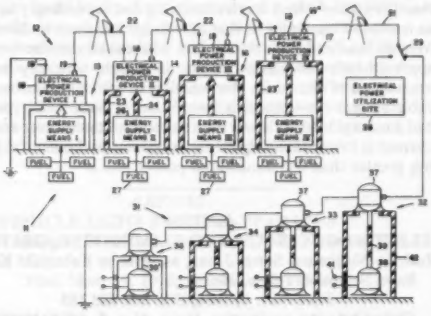
e. means for comparing the levels of said first and second signals when said first and second photodetectors are exposed to radiation from said first source including means responsive to the respective levels of said first and second signals when said first and second photodetectors are exposed to radiation in said second beam for compensating for the effect of any unbalance between said first and second photoelectric channels.

4,057,735
CHRISTMAS TREE LIGHTING CONTROL
George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20034
Continuation-in-part of Ser. No. 542,803, Jan. 21, 1975, Pat. No. 3,946,244. This application Dec. 2, 1975, Ser. No. 637,025
Int. Cl.[2] H02J *3/00*
U.S. Cl. 307—11 **9 Claims**



4. An ornamental lighting control including at least two solid state duty cycle units having a common power input and respectively variable duty cycle outputs, connector means respectively connected to each of said outputs for connecting thereto an ornamental lighting source to be controlled and wherein the duty cycle of said outputs determines the light output intensity of a lighting source connected therewith, motor means, control means movable by said motor means to effect predetermined random variations in the duty cycle of each duty cycle unit whereby the light output intensity pattern of each lighting source, respectively connected to each duty cycle unit, differs from each of the others for a predetermined operating interval of said control means.

4,057,736
ELECTRICAL POWER GENERATION AND DISTRIBUTION SYSTEM
Morris R. Jeppson, P.O. Box 4943, Carmel, Calif. 94921
Filed Sept. 13, 1974, Ser. No. 505,787
Int. Cl.[2] H02J *11/00*
U.S. Cl. 307—78 **45 Claims**



1. An electrical power production system for generating electrical power from non-electrical energy of a form contained within a fluid and for delivering said electrical power to a high voltage transmission line comprising:

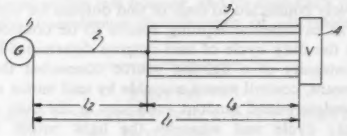
a plurality of relatively low voltage electrical power production stations, each having at least one device for producing electrical power from the non-electrical energy content of said fluid and having insulative support means for said device enabling said device to be operated at an elevated voltage level, each of said stations having a lower voltage region and means for receiving said fluid at said lower voltage region, and each further having conduit means for transmitting said fluid to said device from said lower voltage region for conversion of said non-electrical energy content to electrical power, at least a portion of said conduit means being formed of electrically insulative material, and

conductor means connecting said power production stations in series relationship and terminal means for connecting at least a final one thereof to said transmission line whereby the relatively low voltages produced by said power production stations individually are cumulatively applied to said transmission line to establish a relatively high voltage thereon.

4,057,737

VERY-HIGH-POWER-TRANSMISSION CABLE SYSTEM

Werner Rasquin, Cologne, Germany, assignor to Felten & Guilleaume Carlswerk AG, Cologne, Germany

Continuation of Ser. No. 382,713, July 26, 1973, abandoned.
This application May 21, 1975, Ser. No. 579,497
Claims priority, application Germany, July 29, 1972, 2237428
Int. Cl.² H02B *7/30, 11/02*
U.S. Cl. 307—147 **7 Claims**

1. In combination, an electrical load having load terminals across which predetermined voltage is to be applied; an A.C. power source located remote from said electrical load; and a long-distance power-transmission cable system comprising a first cable system and a second cable system connected in series with each other and connecting said source to said load and operative for transmitting a predetermined power from said source to said load, said second cable system having a natural loading greater than the power which it is transmitting and accordingly having a capacitive character so that its current increases in direction from its load end to its source end whereas its voltage remains approximately constant along its length, said first cable system having a natural loading lower than the power which it is transmitting and accordingly having an inductive character so that its voltage increases in direction from its load end to its source end whereas its current remains approximately unchanged along its length, whereby at the source end of the series combination of said first and second cable system the voltage is lower than if both cable systems had a natural loading lower than the transmitted power and the current is lower than if both cable systems had a natural loading greater than the transmitted power.

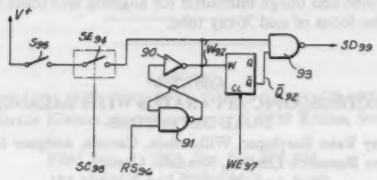
4,057,738

ELECTRONIC CIRCUIT FOR ELIMINATING CHATTER

Izuhiko Nishimura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 629,185
Claims priority, application Japan, Nov. 5, 1974, 49-127345; Nov. 9, 1974, 49-129121
Int. Cl.² H03K *17/00, 17/56*
U.S. Cl. 307—247 A **6 Claims**

1. An electronic circuit for insuring the application of a contact signal comprising in combination contact means for producing a contact signal representative of a change of state; a first periodic pulse signal having a leading edge; asynchronous logic means for receiving as a first input said contact signal and as a second input said first periodic pulse signal, and in response to a coincidence in the changed state of said contact signal and said first periodic pulse signal producing at least one write-in pulse, said asynchronous logic gating means being a set-reset flip-flop means including an inverter means defining an output terminal and a NAND gate means defining a reset input terminal, said first periodic pulse signal being applied to said reset input terminal, and said contact signal being applied to said output terminal, said set-reset flip-flip means producing at least one write-in pulse in response to



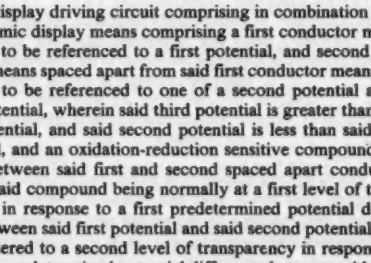
detecting a coincidence in the state of said first periodic reset pulse signal and said change of state contact signal; a second periodic pulse signal having a leading edge and being synchronized with respect to said first periodic pulse signal so that said leading edge of said first periodic pulse signal defining said coincidence condition precedes a leading edge of said second periodic pulse signal; and synchronous logic means for receiving as a first input said write-in pulses produced by said asynchronous logic means and as a second input said second periodic pulse signal, and in response to each said write-in pulse and the leading edge of said second periodic pulse signal, producing an output signal representative of the changed state of said contact signal.

4,057,739

ELECTRO-CHROMIC DISPLAY DRIVING CIRCUIT

Tsutomu Otake, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 1, 1976, Ser. No. 691,694
Claims priority, application Japan, May 29, 1[illegible] 53-64581
Int. Cl.² H03K *17/00*
U.S. Cl. 307—270 **9 Claims**



1. A display driving circuit comprising in combination electro-chromic display means comprising a first conductor means adapted to be referenced to a first potential, and second conductor means spaced apart from said first conductor means and adapted to be referenced to one of a second potential and a third potential, wherein said third potential is greater than said first potential, and said second potential is less than said first potential, and an oxidation-reduction sensitive compound disposed between said first and second spaced apart conductor means, said compound being normally at a first level of transparency in response to a first predetermined potential difference between said first potential and said second potential, and being altered to a second level of transparency in response to a second predetermined potential difference between said third

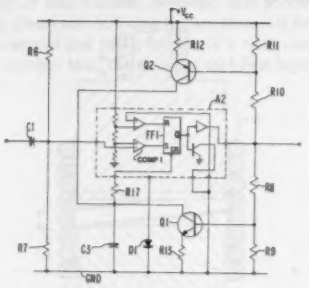
potential and said first potential, and injection type transistor means for alternately and successively applying said second and third potential to said second conductor means, said injection transistor means effecting a transient characterized by an initial sharp increase in current in response to said first predetermined potential difference and a sharp negative decrease to a negative value following said initial sharp increase from a zero level, followed in turn by a return to a zero level, in response to said second predetermined potential difference.

4,057,740

CONSTANT DUTY CYCLE MONOSTABLE

Leonard E. Arguello, San Jose, Calif., assignor to W. R. Grace & Co., New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,612
Int. Cl.² H03K *17/00*; F02P *1/00*
U.S. Cl. 307—273 **6 Claims**



1. Monostable multivibrator circuit with constant duty cycle comprising:

a flip-flop having a first input for switching the flip-flop to a first state, a second input for switching the flip-flop to a second state, and an output;

a comparator means coupled to the first input and capable of generating an output signal when an input signal applied thereto reaches a predetermined level;

a timing and storage means coupled to the second input of said flip-flop;

a charging means coupled to the timing and storage means; and,

a discharging means coupled to the timing and storage means and responsive to output signals from the flip-flop, whereby said timing and storage means is charged by said charging means and is discharged responsive to receipt of an output signal from said flip-flop, and whereby said flip-flop produces its output signal responsive to receipt of an output signal from said comparator means.

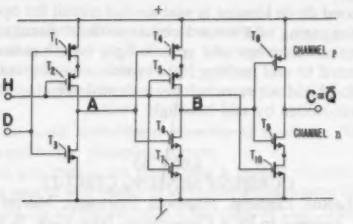
4,057,741

LOGIC CIRCUIT FOR BISTABLE D-DYNAMIC FLIP-FLOPS

Christian Piguet, Neuchatel, Switzerland, assignor to Lasag S.A., Thun, Switzerland

Filed Sept. 16, 1975, Ser. No. 613,917
Claims priority, application Sweden, Sept. 16, 1974, 7401255
Int. Cl.² H03K *3/286, 3/353*
U.S. Cl. 307—279 **8 Claims**

1. A logic circuit for a dynamic D-flip-flop assembled with complementary field effect transistors having insulated grids comprising: a power of supply having a positive pole, a negative pole, and at least three logic gates (A', B', C'), each of which produces an internal variable (A, B, C), wherein each gate is formed by at least three field effect transistors with insulated grids connected in series between the positive pole and ground, and wherein each gate is controlled by at least two variables, one being an input clock signal (H), the first gate (A') including a first transistor (T_1) with a first type of conductivity having a source electrode connected by a first node (N_1) to the positive pole, and a drain electrode connected by a second node (N_2) to the source electrode of a second transistor (T_2) with the same type of conductivity, the drain electrode of said second transistor (T_2) is connected by a third node (N_3) on the one hand to the drain electrode of a third transistor (T_3) with a second type of conductivity whose source electrode is connected by a fourth node (N_4) to ground, and on the other hand to the grid of two transistors (T_4, T_8) of a second gate (B'), the grids of said first and third transistors (T_1, T_3) of the first gate (A') are connected to the input of an external command variable (D), and the gird of said second transistor (T_2) of said first gate (A') is connected to said input of the clock signal (H), the second gate (B') of the circuit includes a fourth transistor (T_4) having the first type of conductivity, and a grid connected to the drain electrode of said second transistor (T_2) of the first gate (A'), its source electrode being connected by a fifth node (N_5) to the positive pole and its drain electrode by a sixth node (N_6) to the source of a fifth transistor (T_5) having the first type of conductivity, the drain electrode of which is connected by a seventh node (N_7) on the one hand to the drain electrode of a sixth transistor (T_6) having a second type of conductivity, whose grid is connected to the drain electrode of said third



transistor (T_3) of the first gate (A'), on the other hand the seventh node (N_7) connects the drain electrode of the fifth transistor (T_5) to the grids of two transistors (T_8, T_9) of the third gate (C'), the source electrodes of said sixth transistor (T_6) is connected by an eighth node (N_8) to the drain electrode of a seventh transistor (T_7) with the second type of conductivity, whose source electrode is connected by a ninth node (N_9) to ground, the grids of said fifth and seventh transistors (T_5, T_7) are connected to said input of the clock signal (H); the third gate (C') of the structure includes an eighth transistor (T_8) of the first type of conductivity, whose grid is connected to the drain electrode of said sixth transistor (T_6) of the second gate (B'), its source electrode is connected by a tenth node (N_{10}) to the positive pole and the drain electrode by an eleventh node (N_{11}) on the one hand to the output (C = Q) of the circuit, and on the other hand to the drain electrode of a ninth transistor (T_9) with the second type of conductivity, whose grid is connected to the drain electrode of said sixth transistor (T_6) of the second gate (B'), its source electrode being connected by a twelfth node (N_{12}) to the drain electrode of a tenth transistor (T_{10}) with the second type of conductivity, whose source electrode is connected by a thirteenth node (N_{13}) to ground, and the grid to said input of the clock signal (H).

4,057,742

VEHICLE LIGHT SWITCH APPARATUS

Ernest W. Binegar, 37 Indian Creek Road, New Smyrna, Fla. 32069

Filed Mar. 19, 1976, Ser. No. 668,706
Int. Cl.² H02G *3/00*
U.S. Cl. 307—10 LS **7 Claims**

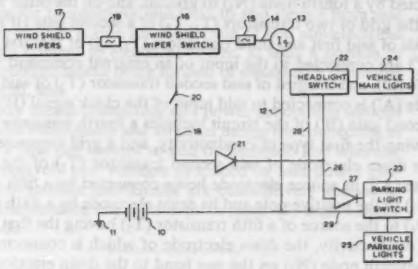
1. A system for automatically turning on vehicle lights responsive to the operation of the vehicle windshield wipers comprising in combination:

a vehicle windshield wiper switch located in a vehicle;

vehicle light switch means having a headlight switch and parking light switch;

a first circuit connecting said windshield wiper switch to said headlight switch of said vehicle light switch means;

a first diode located in said first circuit for operatively disengaging said first circuit responsive to actuation of said headlight switch;



a second circuit coupled between said first circuit and said parking light switch of said vehicle light switch means; and

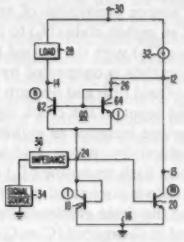
a second diode located in said second circuit for operatively disengaging said second circuit without disengaging said first circuit when said vehicle light switch means is connected to said parking light switch whereby said vehicle windshield wiper switch controls said vehicle lights unless over-ridden by said headlight switch.

4,057,743

CURRENT SENSING CIRCUIT

Allen LeRoy Limberg, Hopewell Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,259
Int. Cl.² H03K *17/00*
U.S. Cl. 307—296 R **8 Claims**



1. In a current sensing circuit for sensing the flow of current through one of the terminals of an impedance, which circuit includes

first and second terminals between which an operating potential may be applied;

means for establishing a current through said impedance;

a current mirror amplifier having input, output and common terminals, said common terminal being connected to said first terminal and said input terminal being connected to said one terminal of said impedance;

amplifier means having input, output and common terminals, said amplifier means common terminal connected to said one terminal of said impedance;

a constant current source for supplying a direct current, said source connected between said second terminal and an interconnection between the output terminal of said current mirror amplifier and the input terminal of said amplifier means; and

load means including a direct current path connected between said second terminal and said amplifier means output terminal:

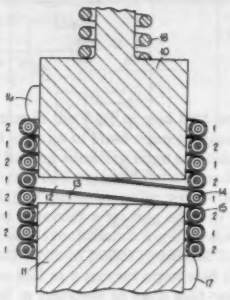
an improvement for lowering the input impedance of said current sensing circuit without need for increasing the current through said load means comprising said current mirror amplifier exhibiting a current gain as between its input and output terminals that is substantially greater than unity.

4,057,744

ELECTROMAGNETIC DEVICES

Alec Harry Seilly, North Wembley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 27, 1976, Ser. No. 754,408
Claims priority, application United Kingdom, Jan. 22, 1976, 2522/76
Int. Cl.² H02K *33/00*
U.S. Cl. 310—27 **4 Claims**



1. An electromagnetic device including a winding through which electric current can be passed, a pair of relatively movable members, a pair or a plurality of pairs of helical coils with the turns of the coils alternately arranged with the turns of the other coil or coils, each of said coils being formed from a length of tubular magnetizable material, the wall of said material being of reduced section over the portions of the coil disposed next to the adjacent coil or coils, said winding comprising conductors disposed within said lengths of material and arranged so that when electric current is supplied to the conductors the current flow in a turn of one coil will be in the opposite direction to the direction of current flow in the adjacent turns of the other coil or coils, the section of said reduced sections being such that flux leakage occurs, said coils being operatively connected to said members whereby the turns of the coils will separate from each other due to the leakage flux to achieve relative movement of the members.

4,057,745

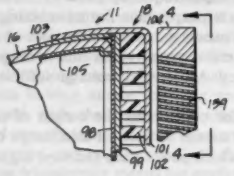
SCANNING X-RAY SOURCE

Richard D. Albert, 317 Hartford Road, Danville, Calif. 94526

Division of Ser. No. 481,954, June 24, 1974, Pat. No. 3,949,229. This application Mar. 4, 1976, Ser. No. 663,988
Int. Cl.² H01J *35/08*
U.S. Cl. 313—55 **9 Claims**

1. A scanning X-ray source having a vacuum envelope with a cathode therein for producing electrons and having a broad anode structure spaced from said cathode and positioned to receive electrons therefrom and having means for directing a narrow electron beam from said cathode to said anode structure for producing X-rays by impact of electrons on said anode structure, said X-ray source further having beam deflection means between said cathode and anode structure for sweeping said electron beam across said anode structure to establish a moving point source of X-rays thereat, said anode structure comprising:

a thin first layer of metallic anode material facing said cathode to receive said electron beam and producing said X-rays in response to electron impact on said first layer, and



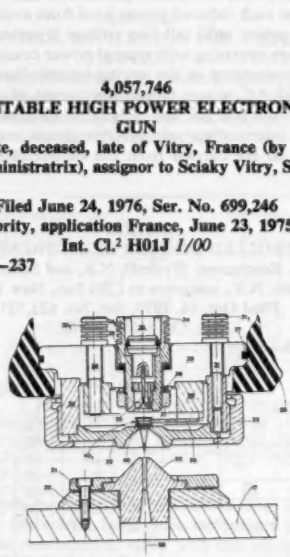
a second layer of backing plate material extending parallel to said first layer and forming at least part of a high strength end wall of said vacuum envelope, said second layer of backing plate material being thicker than said first layer of anode material and being formed of a substance of lower atomic number than the metal of said first layer.

4,057,746

DEMOUNTABLE HIGH POWER ELECTRON BEAM GUN

Paul Dumonte, deceased, late of Vitry, France (by Annie Dumonte, administratrix), assignor to Sciaky Vitry, S. A., Vitry, France

Filed June 24, 1976, Ser. No. 699,246
Claims priority, application France, June 23, 1975, 75.19604
Int. Cl.² H01J 1/00
U.S. Cl. 313—237 12 Claims



1. An electron gun for the generation of high power density electron beams adapted to the welding of workpieces comprising:

means for holding in coaxial position and electrically insulated from one another replacable filament, a wehnelt and anode;

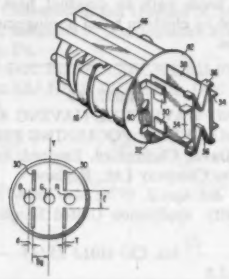
multiple heat and electricity conducting rod means for maintaining the said cathode in coaxial position, one end of each said rod means being rigidly with respect to the said holding means, the other end of each rod means being applied against the outer side wall of the said replacable cathode so as to form a positioning clamp for the said cathode.

4,057,747

IN-LINE PLURAL BEAM COLOR CATHODE RAY TUBE HAVING DEFLECTION DEFOCUS CORRECTING ELEMENTS

Eizaburo Hamano, Fukaya, Japan, assignor to Tokyo Shibaura Electric Company, Ltd., Japan

Filed Oct. 14, 1975, Ser. No. 622,447
Claims priority, application Japan, Oct. 14, 1974, 49-117185
Int. Cl.² H01J 29/50
U.S. Cl. 313—413 13 Claims



11. A color cathode ray tube comprising:

an evacuated envelope including a face plate, a neck portion and an interconnecting funnel section;

a phosphor screen formed on the inner surface of the face plate;

a shadow mask including a plurality of apertures disposed adjacent to the phosphor screen;

electron gun means for projecting a central electron beam and a pair of side beams in an in-line arrangement directed toward the screen through a pin-cushion shaped horizontal deflection field produced by a deflection yoke; and

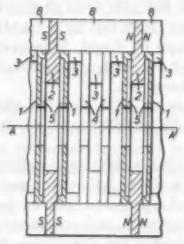
high magnetic permeability deflection defocus correcting means disposed adjacent the paths of the side beams to impart asymmetrical forces to the side beams to compensate for the beam distortion caused by the non-uniformity of the pin-cushion shaped deflection field.

4,057,748

TRAVELLING WAVE TUBES

Peter Robert Davis, Chelmsford, England, assignor to English Electric Valve Company Ltd., England

Filed Feb. 17, 1976, Ser. No. 658,827
Claims priority, application United Kingdom, Mar. 8, 1975, 9908/75
Int. Cl.² H01J 25/34
U.S. Cl. 315—3.5 9 Claims



1. A fundamental coupled cavity travelling wave tube including a stack of apertured plates defining an electron beam path and assembled to provide a plurality of successive coupled cavities for the fundamental mode of operation in which a ferromagnetic plate is located at each end of each cavity and

a plurality of non-magnetic plates are disposed therebetween, and a ferromagnetic pole piece is sandwiched between and contacted by each pair of ferromagnetic plates defining adjacent ends of adjacent cavities, and a periodic permanent magnetic focusing structure surrounding said cavities and consisting of a plurality of ring shaped magnets each of which is in magnetic contact with the pole pieces of an associated cavity, each pair of ferromagnetic plates projecting radially inwardly from the pole piece sandwiched therebetween to provide permanent fields extending into and surrounding the electron beam path of the tube, said ferromagnetic plates being provided with copper portions extending radially outwardly from adjacent said beam path to conduct heat away therefrom which is caused by electron beam impingement on such ferromagnetic plates.

4,057,749

TRAVELLING WAVE TUBE HAVING AN IMPROVED MAGNETIC FOCUSSING FIELD

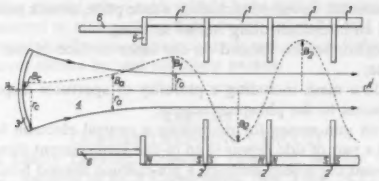
Peter Robert Davis, Chelmsford, England, assignor to English Electric Valve Company Ltd., England

Filed Apr. 2, 1976, Ser. No. 673,348

Claims priority, application United Kingdom, Apr. 3, 1975, 13588/75

Int. Cl.[2] H01J *25/34*

U.S. Cl. 315—3.5 **5 Claims**



1. A travelling wave tube having an electron gun arrangement which produces an initially converging electron beam and a periodic permanent magnetic focussing structure in which the first peak value of the periodic magnetic field encountered by the electron beam is less than the immediately following peak values, the electron gun arrangement and the periodic permanent magnetic focussing structure being arranged so that the position of said first peak value and the position where the diameter of the electron beam attains its first minima coincide, and the periodic permanent magnetic focussing structure being further arranged so that the first zero magnetic field encountered by the electron beam is within the structure itself and is between the position of said first peak and the next following peak.

4,057,750

APPARATUS AND METHOD FOR SUSTAINING THE OPERATION OF HID LAMPS

Robert T. Elms; Joseph C. Engel, Monroeville, and Gary F. Saletta, Irwin, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 10, 1976, Ser. No. 684,513

Int. Cl.[2] H05B *41/14, 41/26*

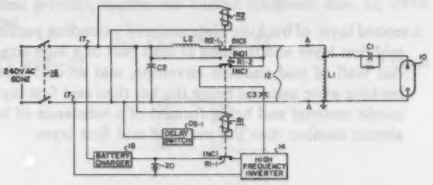
U.S. Cl. 315—86 **9 Claims**

1. In combination with a lighting installation which is normally operable from a 60 Hz AC source and comprises multiple high-pressure discharge lamps each having separate ballast means associated there-with and proximate thereto together with the customary wiring for connecting the lamps and ballasts to the 60 Hz AC source for delivering the normal operating 60 Hz current to such lamps, the improvement which comprises apparatus for preventing such multiple lamps from extinguishing during periods of power interruption of the AC energizing source or during periods of appreciably reduced AC source line voltage, either of which would normally cause the lamps to extinguish for a prolonged period, said apparatus comprising:

a. combined rectifier means and battery means having input terminals adapted to be connected across said AC source to provide standby power;

b. a single high-frequency inverter means having an input and an output, means for connecting the input of said inverter means across the terminals of said battery means, said inverter means when functioning providing a high-frequency AC output voltage sufficient to operate said lamps;

c. means for connecting the output of said high-frequency inverter means to each of said lamps through impedance means which pass a very reduced high-frequency current



as compared to normal lamp operating current so that upon power interruption or appreciable drop in line voltage of said AC source, said lamps are operated from the output of said battery means-powered inverter means at a reduced power level and operation of said lamps is sustained at such reduced power level from available battery means power until full line voltage is restored and said lamps are operating with normal power consumption, and means connected in the wiring intermediate said lamps and said AC source blocks the output of said inverter means from said AC source, and means connected in the wiring intermediate said inverter means and said lamps blocks 60 Hz current from the output of said inverter means.

4,057,751

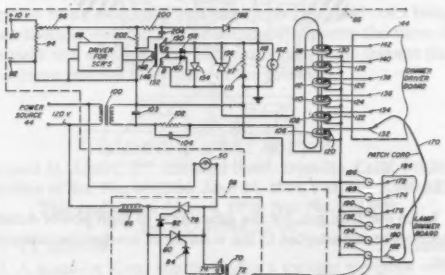
CONTROLLED DIMMER LIGHTING SYSTEM

Salvatore J. Bonsignore, Wyckoff, N.J., and Sabert N. Howell, Huntington, N.Y., assignors to CBS Inc., New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,727

Int. Cl.[2] H05B *37/02*

U.S. Cl. 315—316 **8 Claims**



1. In a controlled lighting system for television studios and the like including an AC voltage source for supplying voltage to a multiplicity of power outlets arranged in a grid on an overhead supporting structure, a multiplicity of lamps supported on overhead supporting structure, and a lighting control console disposed remotely from said outlets and said lamps including a source of control signal voltage, apparatus for

variably controlling the current from said AC voltage source to a lamp load consisting of a preselected group of *n* of said lamps, wherein *n* is two or more, said apparatus comprising:

n pulse-controlled dimmer units, one each of which is connected between one of said power outlets and a respective different one of said *n* lamps and supported proximate its associated lamp, each of said dimmer units having a current capacity appropriate to the wattage of its corresponding lamp and consisting essentially of a pair of gate controlled rectifiers having anode, cathode and gate electrodes connected with their anode-to-cathode paths in inverse parallel arrangement between one terminal of said AC voltage source and one terminal of the associated lamps, and pulse transformer means for applying pulses to said gate electrodes for rendering said rectifiers alternately conductive in successively occurring half cycles of said AC voltage source,

time-variable pulse generating means disposed in said control console and connected to and operative in response to said source of control voltage to generate a pulse train output in which successive pulses occur during discrete half cycles of the output voltage from said AC voltage source, and

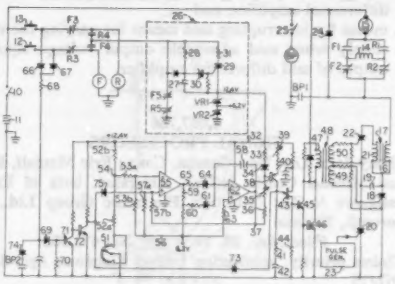
pulse-coupling means connected between said pulse generating means and the pulse transformer means in each of said *n* dimmer units for supplying said pulse train output to each of said *n* dimmer units, thereby to control in unison, the current supplied from said AC voltage source to each of the *n* lamps in said group.

4,057,752

FIRING CONTROL OSCILLATOR FOR A SOLID STATE SWITCH

Robert W. Artrip, Northfield, and Robert G. Klimo, Parma, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Oct. 28, 1975, Ser. No. 626,610
Int. Cl.² H02P *7/00*
U.S. Cl. 318—345 B **14 Claims**



1. In a system for controlling the power from a source of direct current to a motor, said system including a silicon controlled rectifier connected in series with said source and said motor to supply current from said source to said motor when said silicon controlled rectifier is gated into conduction, a commutating circuit for commutating said silicon controlled rectifier at a controlled time after said silicon controlled rectifier has been gated into conduction, a relay having main contacts for connecting said field and armature in series when said relay is energized, and an energizing circuit including a switch for energizing said relay, the improvement comprising:

a. a chargeable and dischargeable timing capacitor,

b. means for producing a reference voltage, including operator-controllable means for varying the level of said reference voltage,

c. means for charging said timing capacitor at a constant current rate which is proportional to the level of said reference voltage,

d. means responsive to a predetermined rise in charging voltage across said timing capacitor for concurrently discharging said capacitor and producing a pulse,

e. means for utilizing said pulse to gate the silicon controlled rectifier into conduction,

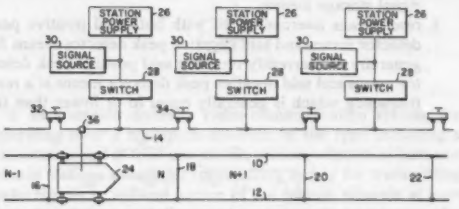
f. means for delaying charging of said capacitor for a predetermined time following energization of said relay and actuation of the contacts associated therewith.

4,057,753

TRAIN VEHICLE CONTROL APPARATUS

Robert H. Perry, Canonsburg, and Howard N. Miller, McMurray, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1975, Ser. No. 621,974
Int. Cl.² H02P *3/14*; B60L *1/00*
U.S. Cl. 318—376 **5 Claims**



1. In apparatus operative with a power supply for controlling the power regeneration operation of a train vehicle moving along a track, said apparatus comprising

means connected to said power supply and providing a predetermined control signal,

switch means connected between said signal providing means and said track for energizing said track with said control signal,

means for sensing the provision of said control signal in said track and

means connected to said sensing means for controlling the power regeneration operation of said train vehicle moving along said track, with said controlling means connecting said train vehicle to said power supply when said control signal is provided and disconnecting said train vehicle from said power supply when said control signal is not provided.

4,057,754

APPARATUS TO MEASURE THE ECCENTRICITY OF A SHAFT

Tamas I. Pattantyus-Abraham, Pittsburgh; Leonard C. Vercellotti, Oakmont, and William H. South, Greenock, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 6, 1976, Ser. No. 684,059
Int. Cl.² G01R *33/12*
U.S. Cl. 324—207 **4 Claims**

1. Apparatus for determining the eccentricity of a shaft, comprising:

a. transducer means for converting said eccentricity into a sinusoidally varying electrical signal at the output thereof, the difference between sequential positive and negative peaks of said electrical signal being indicative of said eccentricity during the interval between said positive and negative peaks;

b. positive peak detector means, the input of which is connected to the output of said transducer means, the output of said positive peak detector means having a positive peak signal thereof which is generally indicative of said positive peak for a first predetermined period of time starting with the occurrence of said positive peak and ending with the reset of said positive peak detector means;

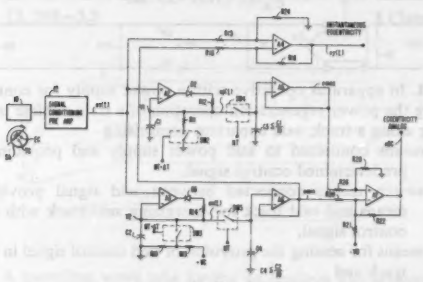
c. negative peak detector means, the input of which is connected to the output of said transducer means, the output

of said negative peak detector means having a negative peak signal thereof which is generally indicative of said negative peak for a second predetermined period of time starting with the occurrence of said negative peak and ending with the reset of said negative peak detector means;

d. positive peak signal storage means, the input of which is connected to the output of said positive peak detector means for storing said positive peak signal for a storage period when said positive peak signal is transferred from said positive peak detector means to said positive peak signal storage means;

e. negative peak signal storage means, the input of which is connected to the output of said negative peak detector means for storing said negative peak signal for said storage period when said negative peak signal is transferred from said negative peak detector means to said negative peak signal storage means;

f. reset means interconnected with both said positive peak detector means and said negative peak detector means for generally concurrently resetting said positive peak detector means and said negative peak detector means at a reset frequency which is generally equal to or lower than the



frequency of said sinusoidally varying electrical signal, the period of said resetting frequency being generally equal to said storage period;

g. sampling means interconnected with both said positive peak detector means and said negative peak detector means for generally concurrently transferring said positive peak signal and said negative peak signal to said positive peak signal storage means and said negative peak signal storage means respectively at said reset frequency but at a predetermined increment of time prior to the application of said reset signal and during both said first and said second predetermined periods of time;

h. adding means having one input thereof connected to the output of said positive peak signal storage means and having another input thereof connected to the output of said negative peak signal storage means, said adding means providing an output signal which is generally equal to the difference between the signal value on said one input and the signal value on said other input thus providing an indication of said eccentricity associated with said interval during a portion of the storage period immediately following said next interval; and

i. means for comparing the stored negative peak signal with the sinusoidal signal.

4,057,755

THERMAL CONDUCTIVITY DETECTOR CIRCUIT

Helfried Piesche, Owingen, Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Germany

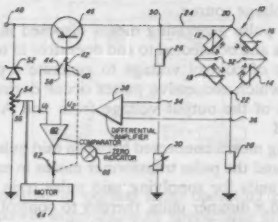
Filed Sept. 10, 1976, Ser. No. 722,248

Int. Cl.² G01R *27/02*

U.S. Cl. 324—62 **6 Claims**

1. In a thermal conductivity detector circuit including a measuring bridge having respective pairs of filaments electrically connected in corresponding legs of said bridge, said measuring bridge positioned in one leg of a second bridge circuit, an adjustable resistor electrically connected in the leg of said second bridge opposite the leg containing said measuring bridge circuit, a differential amplifier connected to the output terminals of said second bridge, current control means connected in circuit between a supply voltage source and said second bridge for supplying current to said second bridge, the output voltage of said differential amplifier controlling the flow of current through said current control means whereby said second bridge becomes balanced, wherein the improvement comprises an auxiliary voltage source for controlling said current control means including:

a. a second voltage supply having an adjustable output voltage;



b. means for electrically comparing the adjustable output voltage of said second supply to the output of said differential amplifier;

c. means responsive to the output of said comparing means for varying the output voltage of said second voltage supply;

d. means for disconnecting said differential amplifier output and electrically connecting said adjustable output voltage of said supply to said current control means when said adjustable output voltage equals the output voltage of said differential amplifier; and

e. means for interrupting said means for varying the voltage supply when said adjustable output voltage equals the output of said differential amplifier.

4,057,756

SIGNAL PROCESSORS

Anthony John Ley, New Canaan, Conn.; Eric Metcalf, Ropley, and Michael Cedric Jeffery, Aldershot, both of England, assignors to The Solartron Electronic Group Ltd., Farnborough, England

Filed Mar. 29, 1976, Ser. No. 671,883

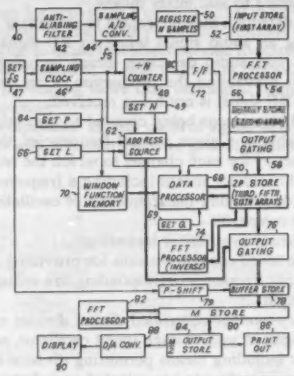
Claims priority, application United Kingdom, Apr. 3, 1975, 13767/75

Int. Cl.² G01R *23/16*

U.S. Cl. 324—77 B **11 Claims**

1. A signal processor comprising means for repeatedly sampling an input signal to form samples, means operative to subject a succession of first, overlapping arrays of the samples to a Discrete Fourier Transform operation to form second, frequency domain arrays, means operative to select from each second array a restricted third array of contiguous point values including a centre value at the centre frequency of a predetermined restricted frequency band, means operative to multiply each restricted third array by a fourth array havng the form of a predetermined window function and representing the Discrete Fourier Trandformation of the impulse response of a band pass filter, thereby to form a fifth array from each third array, means operative to rotate a selected one of the third and fifth arrays through such phase angles as compensate for array to array shifts of epoch of the first arrays created by the overlap of the first arrays, and means operative to subject the fifth arrays to an Inverse Discrete Fourier Transform operation to form sixth time domain arrays of which central groups of point

values are sequential samples of a time-domain signal equivalent to a frequency-shifted result of an aperiodic convolution of



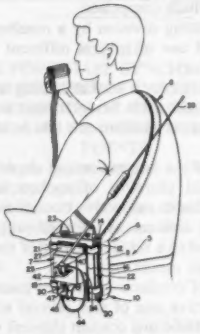
said input signal with said impulse response of said band pass filter.

4,057,757

POWER PACK AND CARRIER FOR CB RADIO

William T. Darden, Jr., 20 Springside Drive, Asheville, N.C. 28806

Filed June 17, 1976, Ser. No. 697,106
Int. Cl.² H01B 1/38
U.S. Cl. 325—16 **6 Claims**



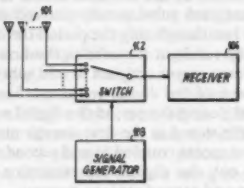
1. A power pack and carrier comprising a body member of a flexible non-elastic material having a pocket receiving a CB radio, said pocket having an outer wall, a housing forming a part of said outer wall, dry cell batteries connected together in series and contained within said housing, means electrically connecting the batteries to the radio, said pocket having an open upper end affording access to the controls of the radio, said pocket being formed in part by straps having adjustable fastening means by which the radio is secured in said pocket and for varying the size of the pocket to accommodate radios of different sizes, a body engaging member forming a part of said carrier and adapted to engage and be supported by a part of the body of the user, and said pocket having a lower end wall provided with a restricted opening to receive an antenna coupling for attachment to the radio.

4,057,758

MOBILE DIVERSITY RADIO COMMUNICATION SYSTEM

Takeshi Hattori, and Fumiyuki Adachi, both of Yokohama, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Japan

Filed Oct. 2, 1975, Ser. No. 618,916
Claims priority, application Japan, Oct. 21, 1974, 49-120377
Int. Cl.² H04B 7/02
U.S. Cl. 325—56 **18 Claims**



1. In a mobile diversity radio communication system, for operating over a multipath medium, of the type including a base station and at least one mobile station, wherein at least one of said stations comprises transmitting means for transmitting radio signals to another station of the system, wherein at least the other station comprises receiving means for receiving radio signals from said transmitting means, an antenna system for radiating the radio signals being transmitted and an antenna system for receiving said radio signals, and wherein at least one of said stations includes a plurality of antenna systems for operating in a space diversity mode, the improvement which comprises:

said transmitting means comprising modulation means for frequency shift modulating the radio signals being transmitted by a digital baseband signal; and

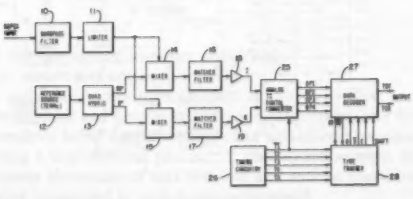
switching means connected to said plurality of antenna systems operable for switching between ones of said antenna systems to render ones of said antenna systems active at a constant rate which rate is higher than the signaling rate of the digital baseband signal but less than the frequency shift width of the frequency shift modulated radio signal, being transmitted thereby to compress average-power dispersion in a signal element of the digital baseband signal.

4,057,759

COMMUNICATION RECEIVING APPARATUS

Arthur F. Genova, Waltham, and Thomas J. Lennon, Burlington, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 23, 1976, Ser. No. 698,943
Int. Cl.² H04B 1/16
U.S. Cl. 325—320 **10 Claims**



1. Receiving apparatus for processing received differential phase shift keyed signals comprising

detecting means for producing quadrature components of each received signal;

analog-to-digital converting means coupled to said detecting

means for deriving digital representations of the resultant of the quadrature components of each signal a number of times during the period of a received signal; the period of a received signal being the duration of the time period during which a received signal is being received;

first storage means coupled to the analog-to-digital converting means for storing a digital representation of a resultant for a period equal to the period of a received signal;

subtraction means coupled to said analog-to-digital converting means and to said first storage means for producing a digital representation of the difference between the digital representation of the resultant stored in the first storage means and each subsequently derived digital representation of a resultant during the period the digital representation of the resultant is stored in the first storage means;

second storage means coupled to said subtraction means for storing one of the digital representations of a difference produced during the period the digital representation of a resultant is stored in the first storage means;

data readout means coupled to said second storage means for reading out the digital representation of a difference stored in said second storage means;

said first storage means being operable to store a digital representation therein in response to an actuating signal;

said second storage means being operable to store a digital representation therein in response to an actuating signal;

said data readout means being operable to read out the digital representation stored in said second storage means in response to an actuating signal;

control means coupled to said first storage means, said second storage means, and said data readout means for producing said actuating signals to the first storage means, second storage means, and data readout means during each period of a received signal; and

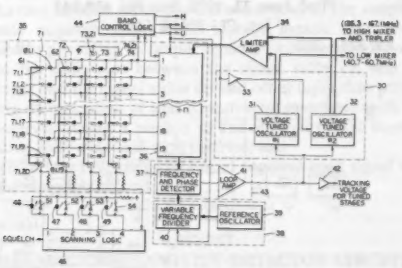
timing adjusting means coupled to said subtraction means and said control means for adjusting the times during the period of a received signal that the control means produces the actuating signals to the first and second storage means and to the data readout means; the timing adjusting means adjusting said times in response to the digital representations of differences produced by the subtraction means during a number of periods, each period being equal to the period of a received signal.

4,057,760

FREQUENCY SYNTHESIZED SCANNER HAVING CONDUCTIVE PROGRAMMING ELEMENTS FOR CHANNEL SELECTION

Richard C. Koch, Denver, Colo., assignor to Regency Electronics, Inc., Indianapolis, Ind.

Filed June 7, 1976, Ser. No. 694,016
Int. Cl.[2] H04B *1/06*
U.S. Cl. 325—455 **7 Claims**



1. In a stepping radio receiver for production of audio signals from radio frequency signals and capable of tuning to several separate channels which radio receiver includes:

a. an RF signal receiving means, a mixer means, and and oscillator means;

b. said RF signal receiving means being for providing sufficient RF signal level for said mixer means;

c. said RF signal receiving means and said oscillator means being coupled to said mixer means;

d. an audio detection means coupled to said mixer means for producing an audio signal when an RF signal is being received, said audio detection means including squelch means for preventing the production of an audio signal when an RF signal is not being received:

e. said oscillator means being coupled to said mixer means and operable at a given several frequencies, there being one frequency for each channel to which the receiver can tune; said oscillator means including a frequency synthesizer for determining the frequency of oscillation of said oscillator means;

f. said frequency synthesizer including:

1. voltage tuned oscillator means for providing an oscillator output frequency corresponding to a voltage present at its input,

2. a binary-number-controlled digital divider coupled to the output of said voltage tuned oscillator, said digital divider including means permitting division by a number corresponding to any selected one of several different binary numbers, each of said several different binary numbers having at least 6 bits and corresponding to a channel to be tuned to;

3. reference means for providing a reference frequency and

4. phase detector means for providing a voltage in response to phase differences between the output of said digital divider and the output of said reference means,

g. scanning logic means which is defeatable and which has several outputs which are coupled to said oscillator means for stepping said oscillator means through said given several frequencies;

h. locking means which is connected to the scanning logic means for defeating said stepping means as long as an RF signal is being received and allowing resumption of operation of said scanning logic means when no signal is being received;

the improvement which comprises:

said means permitting division by a number corresponding to any selected one of several different binary numbers including:

1. several sockets, each socket having several electrical contact elements there being at least as many electrical contact elements as there are bits in said binary numbers,

2. a majority of the corresponding electrical contact elements of said plurality of sockets each connecting through diodes to respective common lines,

3. one contact element of each of said several sockets being coupled to a respective one of the outputs of said scanning logic means and

4. a plurality of conductive contact means each inserted into a respective one of said several sockets to electrically connect said one contact element which is coupled to said scanning logic means to a portion of the remaining electrical contact elements of said respective one of said several sockets.

4,057,761

RECEIVED SIGNAL SELECTING SYSTEM WITH PRIORITY CONTROL

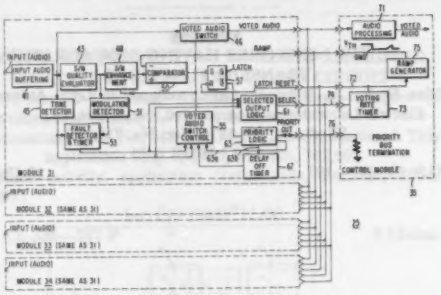
Donald Duane Harbert, Prosperity, and Ronald Gilbert Ferrie, Pittsburgh, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1975, Ser. No. 645,338
Int. Cl.[2] H04B *1/10*
U.S. Cl. 328—154 **3 Claims**

1. In a system for selecting a signal from a plurality of signals, a separate signal quality detector being respectively responsive to each of said signals for providing a level signal

indicative of signal quality, a separate selection gate being responsive to each of said signals with the outputs of said gates being connected in common to a utilization circuit, and means connected to each of said quality detectors responsive to said level signals for providing a control signal to the selection gate corresponding to the quality detector responsive to the best quality signal to cause that selection gate to couple the signal to which it is responsive to said utilization circuit, the improvement for preventing more than one signal being selected at a time comprising:

means responsive to said control signal being provided to any of said selection gates for providing an activity signal,

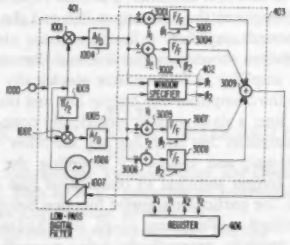


said last mentioned means including further means coupled to each of said selection gates and responsive to said activity signal indicating that one of said selection gates has been operated to pass that one of said plurality of signals to which it is responsive to said utilization circuit to cause the remaining said selection gates to block the passage of the remaining signals of said plurality of signals to said utilization circuit, said further means being responsive to the absence of said activity signal to permit the first one of said selection gates thereafter having said control signal provided thereto to continue to pass to said utilization circuit the signal of said plurality of signals to which that last-mentioned one selection gate is responsive.

4,057,762
DEVICE FOR PHASE SYNCHRONIZING A REPRODUCED REFERENCE CARRIER SIGNAL WITH WINDOWS SPECIFIED FOR PRESELECTED ONES OF AMPLITUDE AND PHASE MODULATED SIGNAL POINTS

Junji Namiki, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Dec. 21, 1976, Ser. No. 753,143
Claims priority, application Japan, Dec. 26, 1975, 50-158851
Int. Cl.² H03D *5/00*
U.S. Cl. 329—50 **5 Claims**



1. For use in a receiver for an incoming amplitude and phase modulated signal selectively representative of true signal points (X_i, Y_i), N in number, arranged on an X-Y complex amplitude plane, a phase synchronizing device for phase synchronizing a reproduced reference carrier signal with an incoming reference carrier signal defining said X-Y plane and contained implicity in said incoming modulated signal, comprising:

a demodulator responsive to said incoming modulated signal and said reproduced carrier signal for producing complex signals selectively representative of coarse signal points (x_i', Y_i') distributed on said X-Y plane around said true points,

a window specifier responsive to said complex signals for producing window signals defining predetermined areas on said X-Y plane which include predetermined ones, n in number, of said true points, n being not greater than N,

means responsive to said complex signals and said window signals for producing difference signals representative of differences (x_i, y_i) in X and Y components between said true points and the coarse points included in said areas,

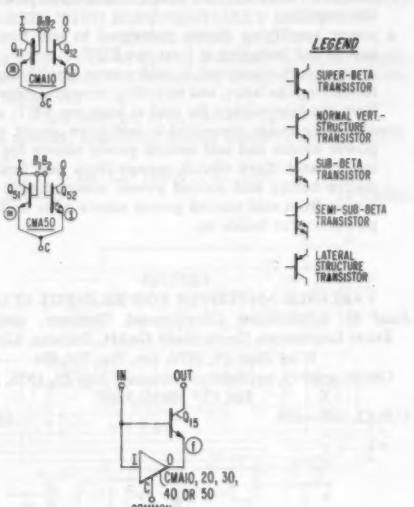
means for calculating a linear sum of the differences, p in number, in the X components and the differences, q in number, in the Y components to produce a sum signal representative of said sum, p and q being not greater than n and not simultaneously equal to zero, and

means responsive to said sum signal for phase controlling said reproduced carrier signal.

4,057,763
CURRENT AMPLIFIERS

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 17, 1976, Ser. No. 687,214
Int. Cl.² H03F *3/04*
U.S. Cl. 330—288 **69 Claims**



3. A current mirror amplifier comprising:

input, output and common terminals;

first and second transistors of a first conductivity type, each having base and emitter and collector electrodes, said first transistor being a superbeta type and said second transistor being a conventional process vertical-structure type, the emitter electrodes of said first and said second transistors being connected to said common terminal;

first galvanic connection means between the collector electrode of said first transistor and said input terminal;

second galvanic connection means between the collector electrode of said second transistor and said output terminal; and

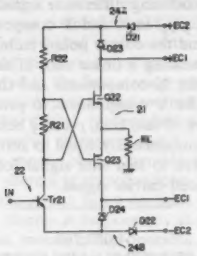
a direct-coupled feedback connection between the collector electrode of said first transistor and an interconnection between the base electrodes of said first and said second transistors.

4,057,764

AMPLIFIER

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 16, 1976, Ser. No. 667,443
Claims priority, application Japan, Mar. 19, 1975, 50-36733
Int. Cl.² H03F *3/04*
U.S. Cl. 330—264 **4 Claims**



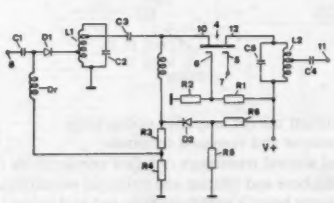
1. An amplifier comprising:
a first power source building up quickly upon power-on of the amplifier;
a second power source building up with a time delay as compared with said first power source upon power-on of the amplifier;
a power amplifying circuit connected to said first power source and including at least one FET;
a drive circuit connected to said power amplifying circuit for driving the latter, and including means for providing at least one bias voltage for said at least one FET; and
switch-over means connected to said drive circuit, said first power source and said second power source for supplying, to said drive circuit, power from said first power source before said second power source builds up and power from said second power source after said second power source builds up.

4,057,765

VARIABLE AMPLIFIER FOR RF INPUT STAGE

Josef H. Schuermann, Oberhummel, Germany, assignor to Texas Instruments Deutschland GmbH, Freising, Germany

Filed June 19, 1976, Ser. No. 706,404
Claims priority, application Germany, July 25, 1975, 2533355
Int. Cl.² H03G *3/30*
U.S. Cl. 330—279 **19 Claims**



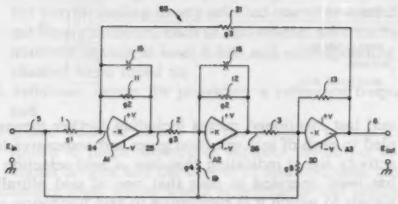
1. A variable gain r.f. input amplifier having a signal input terminal, field effect transistor means including a signal input electrode and a control electrode for receiving a control voltage for adjusting the attenuation of the transistor means, current controlled resistor means consisting of a single semiconductor diode serially connected in a signal path between said amplifier signal input terminal and the input electrode of said field effect transistor means, and diode biasing circuit means including source resistor means for said field effect transistor means having an intermediate tap connected to said semiconductor diode for biasing said diode in response to decreasing conduction of said field effect transistor means from a condition providing low attentuation to a condition providing substantial attenuation in said signal path only after the gain of said field effect transistor means has been reduced by about 10 dB in response to said control voltage.

4,057,766

ACTIVE NETWORKS HAVING BIQUADRATIC TRANSFER FUNCTIONS

Man Shek Lee, Belmont, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 30, 1976, Ser. No. 718,730
Int. Cl.² H03F *1/36*
U.S. Cl. 330—107 **10 Claims**



9. A frequency-selective network satisfying a prescribed transfer function, the network including input and output ports with only one terminals thereof being grounded and having a transfer function which is generally representable as

$$\frac{E_{out}(s)}{E_{in}(s)} = -\frac{(n2s^2 + n1s + n0)}{(d2s^2 + d1s + d0)},$$

where $n2$, $n1$, $n0$, $d2$, $d1$, and $d0$ are constant coefficients which may be zero and s is the complex frequency variable, the network comprising: first, second, and third operational amplifiers each having at least one input line and having at least one output line; first, second, and third input resistors in the one input lines of associated amplifiers; said first, second, and third resistors and first, second, and third amplifiers being electrically connected in series, the one input line of said first amplifier being electrically connected through said first resistor to the other — ungrounded input terminal; a first capacitor electrically connected between the one output line and the one input line of said first amplifier; a second capacitor electrically connected between the one output line and the one input line of said second amplifier; a fourth resistor electrically connected between the one output line and the one input line of said third amplifier; a fifth resistor electrically connected between the third amplifier one output line and the first amplifier one input line; a sixth resistor electrically connected between the third amplifier one input line and the other — ungrounded input terminal; and means for coupling the other — ungrounded output terminal to one output line of one of said amplifiers; the particular transfer function being a function of the normalized conductances $g1$, $g2$, and $g3$ of said first, second and sixth resistors, respectively, being prescribed by selected values of these conductances which are at least initially normalized with respect to the capacitances of said first and second capacitors with the normalized conductances of said third and fourth resistors being at least initially set to unity, and being representable as

$$\frac{E_{out}(s)}{E_{in}(s)} = -\frac{(g3s^2 + g1\,g2)}{(s^2 + g2^2)} = -A\frac{(s^2 + n0)}{(s^2 + d0)},$$

where A is the gain of network, $n2 = d2 = 1$, and $n1 = d1 = 0$, values of other coefficients and the normalized conductances of said resistors satisfying the relationships

$$g1 = \frac{n0\,A}{g2}\;;\; g2 = \sqrt{d0}\;;\; g3 = A\,.$$

4,057,767

DEVICE FOR PROTECTING AN AUDIO AMPLIFIER AGAINST OVERLOAD OR SHORT CIRCUIT

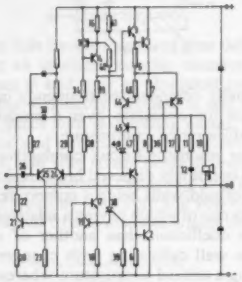
Robert Ronald Laupman, Wijchen, Netherlands, assignor to Novanex Automation N. V., Netherlands

Continuation of Ser. No. 542,773, Jan. 21, 1975, abandoned. This application July 6, 1976, Ser. No. 702,901

Claims priority, application Netherlands, Jan. 24, 1974, 7400977

Int. Cl.² H03F *21/00*

U.S. Cl. 330—207 P **5 Claims**



1. In an audio amplifier circuit, the combination of:

a pair of output transistors and a pair of resistors, the collector-emitter circuits of said transistors being connected in series through said resistors and the junction of said resistors defining an output terminal of the amplifier;

control means connected to the base electrodes of said transistors for alternately biassing said transistors to conduct in accord with an audio input signal, said control means including first means responsive to voltage developed across one of said resistors for limiting the bias applied to one of said transistors, and second means responsive to voltage developed across the other of said resistors for limiting the bias applied to the other of said transistors; and

decoupling means connected across said resistors and responsive to a predetermined excess current through either one of said resistors for removing bias on said transistors.

4,057,768

VARIABLE INCREMENT PHASE LOCKED LOOP CIRCUIT

Hans Yohanan Julliusburger, Putnam Valley, and Donald Wortzman, Carmel, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,700

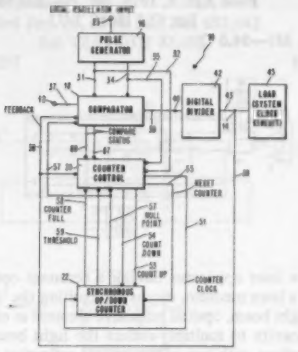
Int. Cl.² H03B *3/00*

U.S. Cl. 331—1 A **7 Claims**

1. A digital phase locked loop circuit for synchronizing the phase and frequency of a digital local feedback signal with a digital data input signal comprising

means for comparing the feedback signal and the data input signal during a predetermined sequence and measuring a number of pulses which represents the instantaneous phase deviation between said signals, and

means responsive to an output of said comparator means for



effecting phase adjustments of the feedback signals by adding to or deleting groups of pulses from the comparator output signal during each said sequence that are proportional to the instantaneous phase deviation between the feedback signal and the data input signal.

4,057,769

CIRCUIT FOR GENERATING TWO DISTINCTIVE TONE BURSTS WITH EXPONENTIALLY DECAYING ENVELOPES

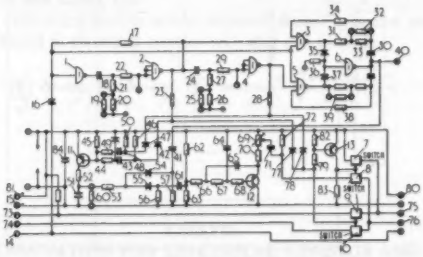
Lawrence Dudley Woolf, Jersey, Guernsey (Channel Island), assignor to Rediffusion Reditronics Limited, Jersey, Guernsey (Channel Is.)

Filed Sept. 14, 1976, Ser. No. 723,097

Claims priority, application United Kingdom, Sept. 16, 1975, 38002/75

Int. Cl.² H03B *3/02, 3/04*

U.S. Cl. 331—49 **11 Claims**

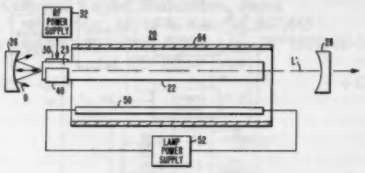


1. An electrical signal generator comprising an electric wave oscillator, for producing oscillations at two predetermined frequencies and having two separate input circuits respectively to provide oscillations at said two frequencies and a common output circuit for providing the oscillations, an attenuator device coupled to said output circuit for attenuating oscillations produced by the oscillator in a manner which varies over a period of time, control means connected with the two oscillator input circuits to produce a burst of oscillations at one said predetermined frequency and a subsequent burst of oscillations at the other said predetermined frequency, and said control means further being connected with the attenuator device to set the attenuator for decay of the oscillations over the priod of each burst.

4,057,770
ACOUSTO-OPTIC Q-SWITCH

Tom Henningsen, Monroeville, and John J. Conroy, Verona, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 5, 1976, Ser. No. 673,562
Int. Cl.² H01S 3/11
U.S. Cl. 331—94.5 Q **7 Claims**



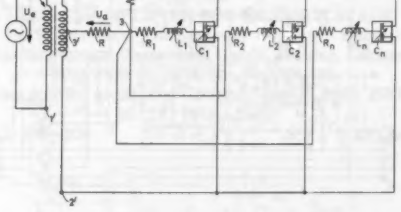
1. In a laser apparatus having a resonant optical cavity including a laser medium, means for exciting the laser medium to emit a light beam, optical reflective element at either end of the optical cavity to multiply-reflect the light beam through the laser medium with one of the optical reflective elements being partially transmissive to the light beam to transmit a laser output beam, and an etalon disposed between one end of said laser medium and one of said optical reflective elements to determine the frequency bands of the laser output beam, the combination of,

an acoustic-optic Q-switch means affixed in combination with said etalon and responsive to RF excitation by transmitting acoustic waves through said etalon to diffract the light beam emitted by said laser medium.

4,057,771
FREQUENCY-RESPONSE CORRECTIVE NETWORK

Hans-Joachim Schmidt, Nurnberg, Germany, assignor to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH, Nurnberg, Germany

Filed Mar. 12, 1976, Ser. No. 666,230
Claims priority, application Germany, Mar. 21, 1975, 2512459
Int. Cl.² H03H 7/10, 7/16; H04B 3/14
U.S. Cl. 333—70 R **17 Claims**

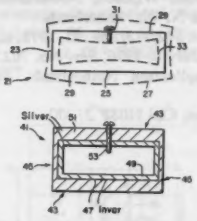


1. A corrective equalizer network for obtaining a desired attenuation versus frequency characteristic, comprising a source having output terminals; a plurality of non-active stages each having an input connected across the output terminals of the source for receiving input signals from the latter, an output for supplying output signals to a load, and adjustable reactance elements intermediate the respective input and output of every stage; means for tuning at least one of the adjustable reactance elements of each stage so as to set every stage to be resonant at different frequencies of the frequency spectrum of the input signals; and means for adjusting at least one of the adjustable reactance elements of each stage independently from other adjustable reactance elements of every other stage so as to selectively vary the amplitude of at least a selected one of the respective frequencies of the spectrum for altering the level of attenuation at said selected one frequency, whereby the output signals supplied to the load have the desired attenuation versus frequency characteristic for the entire frequency spectrum.

4,057,772
THERMALLY COMPENSATED MICROWAVE RESONATOR

Richard V. Basil, Jr., Canoga Park; Leons Ondrups, Pacific Palisades, and James K. Shimizu, Palos Verdes Estates, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 18, 1976, Ser. No. 733,833
Int. Cl.² H01P 1/30, 7/06
U.S. Cl. 333—83 T **23 Claims**



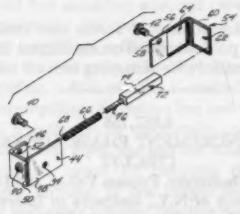
13. A thermally compensated frequency controlled microwave resonator for operation over a predetermined operational temperature range, comprising:

a rectangular resonator having conductive inner wall surfaces and oppositely disposed broad and narrow walls, at least one of said walls being a composite wall of integral wall layers one of which having a relatively lower thermal expansion coefficient than another of said layers, said composite wall deforming with changes in temperature and having a critical temperature whereat said composite wall snaps from one stabilized curvature condition to a different stabilized curvature condition, said critical temperature being outside said operational temperature range, said composite wall having an initial deformation in one of said stabilized curvature conditions to render said composite wall frequency sensitive.

4,057,773
MAGNETIC SWITCH

Morton Cohen, 41-27 Westmoreland St., Little Neck, N.Y. 11363

Filed Feb. 9, 1976, Ser. No. 656,098
Int. Cl.² H01H 9/00
U.S. Cl. 335—205 **17 Claims**



1. A switch activated by a magnetic force comprising: a housing; at least two spaced apart electrical terminals; on said housing; an electrically conductive coil spring supported at one end thereof within said housing; an elongated, magnetically responsive, conductive member axially supported by said spring in a cantilevered fashion within said housing, said elongated member and said spring being adapted to move from

aligned to deflected positions responsive to a magnetic force; first contact means interconnecting the supported end of said spring with one of said terminals, and second contact means interconnected to the other of said terminals encircling said conductive member and contacting said conductive member in one of said aligned and deflected positions.

4,057,774

MINIATURE TIME-DELAY FUSE

Hiroo Arikawa, 1-14-9, Oyamadai, Setagaya, Tokyo; Fumitake Akiyama, 1332 Kamisugeta-cho, Hodogaya, Yokohama, and Masaya Maruo, 1-29-14, Shinkoyasu, Kanagawa, Yokohama, all of Japan

Filed Apr. 16, 1976, Ser. No. 677,749
Claims priority, application Japan, Apr. 16, 1975, 50-045334
Int. Cl.² H01H *85/04*
U.S. Cl. 337—164 8 Claims

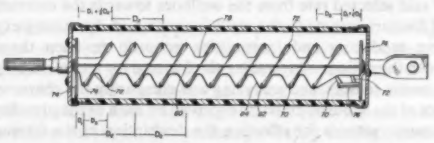
1. A time-delay fuse having improved time delay characteristics comprising an insulated tubular member having two ends, sealing means at said ends, an elongated generally cylindrical core member diagonally disposed in said tubular member in intimate contact with said sealing means, a wire strand spirally wound on said elongated core member and fixed at both ends thereof, said wire strand being defined by a pair of mutually fusible wire elements consisting of a first wire element wound over a second wire core and said elongated core member being selected from a material which has a high thermal conductivity.

4,057,775

SUPPORT ASSEMBLY FOR FUSIBLE ELEMENT OF A HIGH VOLTAGE FUSE

Bruce A. Biller, Chicago, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Nov. 19, 1975, Ser. No. 633,293
Int. Cl.² H01H *85/02*
U.S. Cl. 337—186 21 Claims



1. A support assembly for supporting in a predetermined three-dimensional helical path at least one fusible element within the body of a fuse comprising:

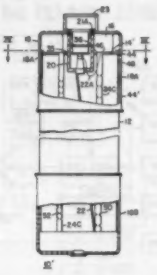
a first and a second support member, each of said support members identically formed of a sheetlike electrically non-conductive material and having a slot formed along the central axis thereof from one end to at least the middle thereof, and each of said support members having fusible element retaining recesses formed along the edges thereof in a predetermined positional relationship, said first and second support members being joined together along said slots approximately at right angles to each other with respect to said central axis, the predetermined positional relationship being such that the fusible element retaining recesses align to form the predetermined three-dimensional helical path of the fusible element when said first and second support members are joined.

4,057,776

FUSE WITH RADIALLY ORIENTED ELEMENTS

Donald D. Blewitt and Robert D. Binz, West View Borough, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1976, Ser. No. 653,042
Int. Cl.² H01H *85/08*
U.S. Cl. 337—295 5 Claims



1. A fuse, comprising:

a. electrically insulating, hollow, cylindrical fuse barrel means;

b. terminal means disposed adjacent one end of said barrel means;

c. flat, circular, plate means disposed transverse to the center line of said cylindrical barrel means adjacent to the other end of said barrel means, said plate means having a radial slot therein;

d. a fuse ribbon electrically connected to said terminal means and extending within said barrel means longitudinally thereof in a generally radial orientation, said fuse ribbon having an end portion thereof which feeds through said slot and folds over against one side of said plate means perpendicular to said slot, said ribbon being folded over again upon a portion of itself and said plate means in a parallel orientation to said slot, said end portion being also folded against the edge of said plate and along the outside of said barrel; and

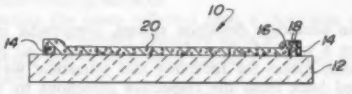
e. cylindrical ferrule means disposed securely against said barrel in electrical contact with said end portion.

4,057,777

TERMINATION FOR ELECTRICAL RESISTOR AND METHOD OF MAKING SAME

Kenneth M. Merz, Gladwyne, and Howard E. Shapiro, Philadelphia, both of Pa., assignors to TRW Inc., Cleveland, Ohio

Filed Nov. 19, 1975, Ser. No. 633,398
Int. Cl.² H01C *1/012*
U.S. Cl. 338—309 38 Claims



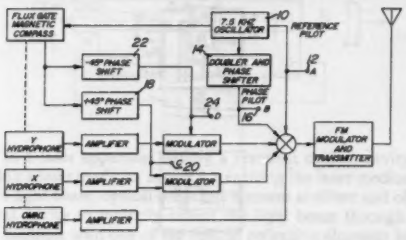
1. A conductive termination material for electrical components comprising a mixture of fine metal particles of an alloy of nickel and iron and a glass frit.

4,057,778

BUILT-IN TEST EQUIPMENT FOR SONOBUOY

Albert M. Bates, Southampton, and Anthony J. Madera, Doylestown, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 1, 1976, Ser. No. 737,305
Int. Cl.[2] H04B 11/00
U.S. Cl. 340—2 11 Claims



1. Built-in equipment for self testing a plurality of operating signals within a sonobuoy, comprising, in combination:

sampling means adapted to receive the operating signals for sampling respective ones of the operating signals and for sequentially producing sample signals thereof;

reference means for generating a plurality of reference signals each indicative of the tolerance level of a respective one of the operating signals; and

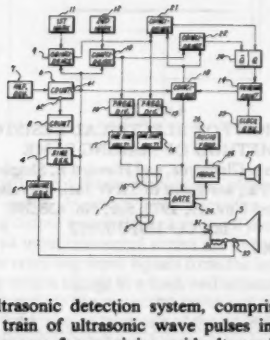
comparison means connected to receive said sample and reference signals for comparing the corresponding respective ones of said sample and reference signals and for producing tolerance signals each indicative of a respective one of the operating signals when beyond its tolerance level.

4,057,779

ULTRASONIC DETECTION SYSTEM

Masajiro Iida; Hideharu Morimatsu, both of Takarazuka; Itsuo Fukuoka, and Yoshinari Yoshida, both of Nishinomiya, all of Japan, assignors to Furuno Electric Company, Limited, Japan

Filed Feb. 2, 1976, Ser. No. 654,476
Claims priority, application Japan, Feb. 18, 1975, 50-20595
Int. Cl.[2] G01S 7/62
U.S. Cl. 340—3 C 7 Claims



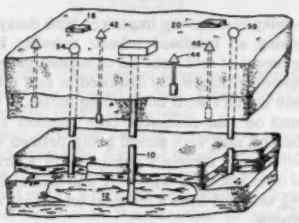
1. An ultrasonic detection system, comprising means for emitting a train of ultrasonic wave pulses in all peripheral directions, means for receiving said ultrasonic wave pulses reflected back from the respective directions by means of rotating directivity and producing a reception signal and means for indicating said reception signal on a cathode ray tube screen scanner circularly in synchronism with the emitted ultrasonic wave pulses, said system further comprising means for generating a train of low frequency pulses, a reversible counter circuit for counting said low frequency pulses, means for inverting said reversible counter circuit at two different counts of said reversible counter circuit, means for indicating a radial bright line on said screen in response to each count output of said reversible counter circuit, and means for sampling said reception signal in response to each of said count outputs and producing an audible signal in response to said sampled reception signal, whereby a simulated radial bright line is reciprocated between two directions corresponding to said two different counts of said reversible counter circuit and, at the same time, the presence of the reception signal in the direction of said bright line is audibly signalled.

4,057,780

METHOD FOR DESCRIBING FRACTURES IN SUBTERRANEAN EARTH FORMATIONS

Lowell Z. Shuck, Morgantown, W. Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 19, 1976, Ser. No. 668,346
Int. Cl.[2] G01V 1/02, 1/28
U.S. Cl. 340—15.5 MC 4 Claims



1. A method for describing the configuration and directional orientation of a natural or a previously induced fracture extending from a wellbore penetrating a sub-surface earth formation containing the fracture, comprising the steps of positioning a plurality of acoustic sensors at selected locations about the wellbore, introducing a liquid explosive of a preselected detonation rate in the range of about 100 to 3000 meters per second into the fracture, detonating the liquid explosive at the wellbore to effect propagation of the explosion in the fracture at said selected rate from the wellbore towards the extremities of fracture remote to the wellbore with said detonating explosive producing and transmitting acoustic emission through earth formations surrounding the fracture for reception by said acoustic sensors, and analyzing and comparing the characteristics of the acoustic emission received by each of the plurality of acoustic sensors for effecting the description of the fracture.

4,057,781

WELL BORE COMMUNICATION METHOD

Serge A. Scherbatskoy, 3517 Westridge, Fort Worth, Tex. 76116

Filed Mar. 19, 1976, Ser. No. 668,646
Int. Cl.[2] G01V 1/40
U.S. Cl. 340—18 LD 33 Claims

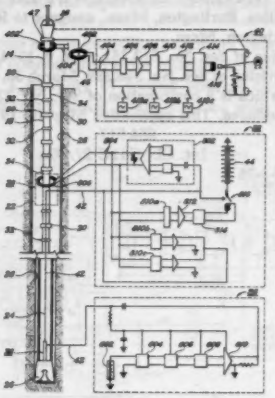
21. A system for transmitting data from a sensor at the bottom of a drill string to an indicator at the surface of the earth, comprising:

a. a wireless signal transmitter positioned at an intermediate location between said bottom and said surface;

b. an electrical wire directly interconnecting said sensor and said signal transmitter with said sensor and said transmitter being disposed several hundred feet apart;

c. an electrical power source interconnected with said elec-

trical wire and adapted to energize said sensor and said transmitter; and



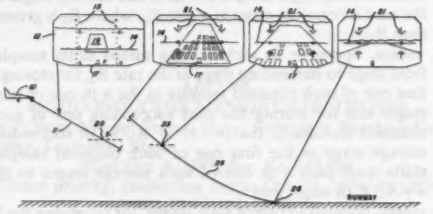
d. a wireless communication channel including said transmitter and said indicator.

4,057,782

LOW ALTITUDE HEAD UP DISPLAY FOR AIRCRAFT

Hans Rudolf Muller, Kirkland, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 5, 1976, Ser. No. 673,794
Int. Cl.² G08C *5/00*
U.S. Cl. 340—27 AT **6 Claims**



1. A head up visual approach aircraft instrument, having a screen on which the pilot of an aircraft views a collimated display of flight guidance information against a background of the outside world, the display including first indicia movable vertically on the screen as a target for the pilot, second indicia movable vertically on the screen representing the flight path of the aircraft, for alignment of both indicia with an outside world aiming point by manipulation of the aircraft altitude and speed, wherein said instrument comprises:

means for positioning said first indicia on said screen successively in accordance with an approach path to said outside world aiming point, then along a transition path from said approach path and then in alignment with the horizon to define a path above and generally parallel with the ground; and

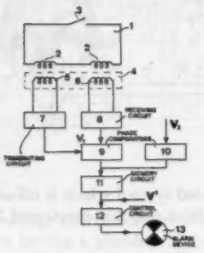
means for positioning said second indicia successively in accordance with an approach path command, and then with a transition path command, manipulation of the aircraft by the pilot to align said second indicia with said first indicia causing said aircraft to follow said approach and transition paths and to continue in a path above and generally parallel with the ground, as for ejection of cargo from the aircraft while airborne.

4,057,783

DEVICE FOR TRANSMITTING THE CONDITION OF A SWITCH BETWEEN TWO PARTS IN RELATIVE ROTARY MOVEMENT

Jean-Claude Blanchier, Orsay, France, assignor to Jaeger, Lavallois Perret, France

Division of Ser. No. 519,271, Oct. 30, 1974, Pat. No. 3,990,041. This application Aug. 13, 1976, Ser. No. 714,283
Claims priority, application France, Nov. 7, 1973, 73.39588; June 28, 1974, 74.22741
Int. Cl.² B60C *23/02*
U.S. Cl. 340—58 **10 Claims**



1. A switch-condition transmitting device comprising:

a. a first assembly consisting of a switch and at least two coils which are serially connected when said switch is closed;

b. a second assembly comprising at least a transmission coil and detection coil, said coils of the second assembly being magnetically coupled to each other and being positioned so that in one relative position of said assemblies the transmission coil is magnetically coupled to one coil of the first assembly while the detection coil is magnetically coupled to the other coil of the first assembly;

c. exciting means for causing the transmission coil of the second assembly to generate an alternating magnetic field; and

d. detecting means coupled to the detection coil of the second assembly for producing different outputs respectively when said switch is closed and when said switch is open, said detecting means comprising a phase comparator having a first input connected to said exciting means and a second input connected to said detection coil, said phase comparator providing at an output a first output signal when said switch is open and said detection coil is excited only from the field of said transmission coil, and a second output signal when said switch is closed and said detection coil is excited from said other coil of the first assembly.

4,057,784

BI-DIRECTIONAL SCANNER ASSEMBLY

Benny R. Tafoya, Furlong, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 27, 1976, Ser. No. 727,196
Int. Cl.² G06K *7/10*
U.S. Cl. 340—146.3 F **9 Claims**

1. The method of optically scanning a coded symbol comprising the steps of;

a. generating two beams of light;

b. causing the different beams to be reflected off respective counter-rotating surfaces;

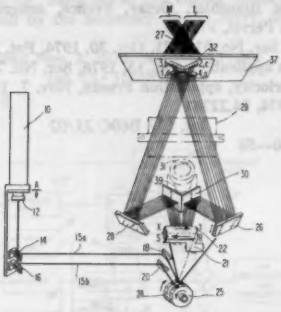
c. directing the beam reflected from a clockwise rotating surface to a vibrating reflective surface;

d. directing said vibrated beam against a V-shaped reflective surface;

e. directing further the beam reflected from said V-shaped reflective surface to first and second reflective surfaces to trace an X-shaped scan against said coded symbol;

f. directing upon the completion of said X scan the beam reflected from the counter-clockwise rotating surface

successively to said vibrating, V-shaped and first and second reflective surfaces to form an X scan that impinges



upon said coded symbol which is off-set from and oppositely traced from said first-mentioned X scan.

4,057,785

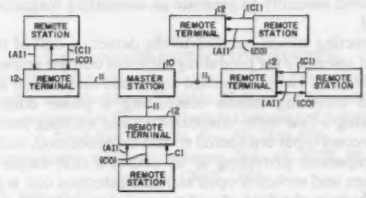
SEQUENCE OF EVENTS RECORDER AND SYSTEM FOR TRANSMITTING SEQUENCE DATA FROM A REMOTE STATION TO A MASTER STATION

William E. Furniss, Murrysville, Pa.; George I. Vancsa, Wexford, and Joseph R. Onufer, Edison, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 14, 1975, Ser. No. 558,513

Int. Cl.² H04G 9/00

U.S. Cl. 340—163 **22 Claims**



1. System apparatus for detecting and recording a time sequence of status changes of a plurality of two-state devices at each of a plurality of locations, said apparatus comprising:

a remote terminal unit for each of the locations,

means for processing and recording data at a master station in response to data signals received from said remote terminals,

means for transmitting data signals between said remote terminals and said master station under predetermined control conditions,

each of said terminals including first means for periodically detecting the state of each device associated therewith,

second means for comparing the currently detected state of each associated device with the previously detected state of the associated device to detect a difference between such state,

third means for storing the identity and the currently detected state of an associated device when such state differs from the previously detected state, and for storing a representation of the elapsed time at which the difference is detected relative to a reference time point, and

said master station means including means for recording absolute time to enable correlation of transmitted elapsed time data from said remote terminals.

4,057,786

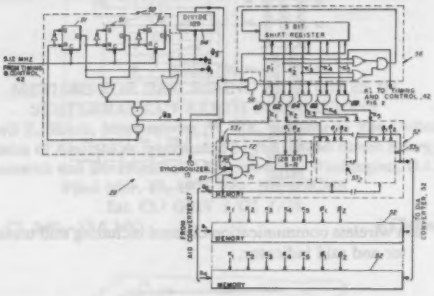
RECIRCULATING DELAY LINE TIME COMPRESSOR HAVING PLURAL INPUT TAPS

John D. Collins, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 513,352, Oct. 9, 1974, abandoned, which is a division of Ser. No. 346,389, March 30, 1973, Pat. No. 3,879,661, which is a continuation of Ser. No. 229,210, Feb. 1, 1972, abandoned. This application May 10, 1976, Ser. No. 684,517

Int. Cl.² G11C 21/00

U.S. Cl. 365—76 **1 Claim**



1. Apparatus for storing an input signal of time duration T_1 and for retrieving such stored input signal in a different, shorter time duration T_2, comprising:

a. means for serially obtaining a predetermined number, N, of samples of the input signal at a rate R_1;

b. a recirculating delay line having a plurality of serially coupled storage stages;

c. means for shifting a sample stored in one of such stages to the next succeeding stage at a rate R_2, where R_2 is greater than R_1;

d. means, operative as such shifting means shifts samples from stage to succeeding stage at the rate R_2, for storing a first one of such obtained samples in the n th one of such stages and for storing the next succeeding one of such obtained samples in the $(n-1) + R_2/R_1$ th succeeding storage stage as the first one of such obtained samples shifts from such n th one of such storage stages to the $n+R_2/R_1$th stage; and

e. means, coupled to one of such stages, for retrieving the N samples as such samples are shifted thereto at the rate R_2, such N samples being retrieved in the time duration T_2.

4,057,787

READ ONLY MEMORY

Dale A. Heuer, Stewartville; John F. Roemer, and Michael J. Sheehan, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 539,904, Jan. 9, 1975, which is a continuation of Ser. No. 391,425, Aug. 23, 1973, abandoned. This application Feb. 13, 1976, Ser. No. 657,796

Int. Cl.² G11C 11/40

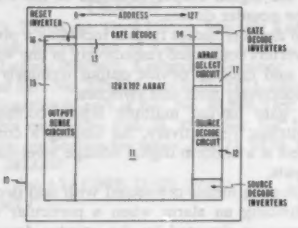
U.S. Cl. 365—104 **13 Claims**

1. A solid state read only memory unit comprising a plurality of bit locations arranged in rows and columns with each bit location having first and second output electrodes and a gate position, said bit location being capable of transistor action between said first and second electrodes when a gate is installed at said gate position, said bit location upon being addressed by charging the first output electrode and said gate position indicating a first logic level at said second output electrode when a gate is installed at said gate position and a second logic level when a gate is not installed at said gate position;

first address means including a series of source lines each connected to the first output electrodes of a row of said bit

locations, a plurality of first address circuits and first decoding means for selecting at least one source line in accordance with the input received from said first address circuits;

second address means including a series of gate connecting lines each connected to gates installed in a column of bit locations, a plurality of second address circuits and a second decoding means interconnected with said second



address circuits and said gate connecting lines for selecting one of said gate connecting lines in accordance with the input received from said second address circuits;

sense means including a plurality of sense lines each connected to a row of bit location second output electrodes; and

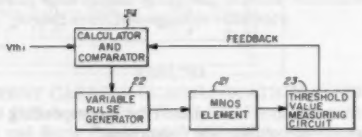
switch means selectively operable to connect all sense lines to a common potential to thereby remove a charge resident on such sense lines.

4,057,788

SEMICONDUCTOR MEMORY STRUCTURES

Jay P. Sage, Newton Center, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 6, 1975, Ser. No. 619,890
Claims priority, application Japan, Oct. 21, 1974, 49-120265
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—174 **6 Claims**



1. In combination:

a semiconductor memory device comprising a semiconductor substrate, an insulating layer provided on said semiconductor substrate, an electric charge capture layer provided on said insulating layer, and an electrode layer provided on said electric charge capture layer; and

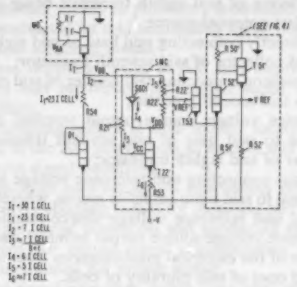
means for setting any of a plurality of predetermined voltages to said electrode layer relative to said semiconductor substrate to inject an electric charge into said electric charge capture layer from said semiconductor substrate, having a unidirectional component corresponding to said threshold voltage to be set and a cyclically varying component at least the amplitude or pulse length of which is gradually diminished during a plurality of cycles of said cyclically varying component.

4,057,789

REFERENCE VOLTAGE SOURCE FOR MEMORY CELLS

Richard I. Spadavecchia, Hopewell Junction, and James R. Struk, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 19, 1974, Ser. No. 480,794
Int. Cl.[2] G11C *7/06, 11/40*
U.S. Cl. 365—189 **2 Claims**



1. A reference voltage source for use in a random access monolithic memory having a plurality of data storage cells, each of said cells comprising a first transistor and a second transistor,

each of said cells being adapted to assume either a first stable state of conductivity or a second stable state of conductivity,

sense amplifier means coupled to said plurality of data storage cells,

selection means coupled to said plurality of cells for causing predetermined ones of said plurality of cells to electrically manifest to said sense amplifier means whether said predetermined ones of said plurality of cells are respectively in said first stable state of conductivity or said second stable state of conductivity,

said sense amplifier means being responsive to said electrical manifestations of said predetermined ones of said plurality of cells and said reference voltage source for providing a first electrical output for each of said predetermined ones of said plurality of cells which is in said first stable state and a second electrical output for each of said predetermined ones of said plurality of cells which is in said second stable state,

said reference voltage source comprising:

a third transistor having a collector, base and emitter;

said collector of said third transistor being directly connected to a first potential;

a first resistor connecting said base of said third transistor to said first potential;

a fourth transistor having a collector, base and emitter;

a second resistor connecting said collector of said fourth transistor to said emitter of said third transistor;

means directly connecting said base of said fourth transistor to said collector of said fourth transistor;

means directly connecting said emitter of said fourth transistor to a second potential source;

a fifth transistor having a collector, base and emitter;

a third resistor connecting said emitter of said fifth transistor to said second potential source;

a fourth resistor connecting said emitter of said third transistor to said base of said fifth transistor;

a Schottky Barrier diode connected between said emitter of said third transistor and said collector of said fifth transistor;

fifth and sixth resistors serially connected between said emitter of said third transistor and said collector of said fifth transistor;

a sixth transistor having a collector, base and emitter;

means directly connecting said collector of said sixth transistor to said first potential;

means directly connecting said base of said sixth transistor to the juncture of said fifth and sixth resistors;

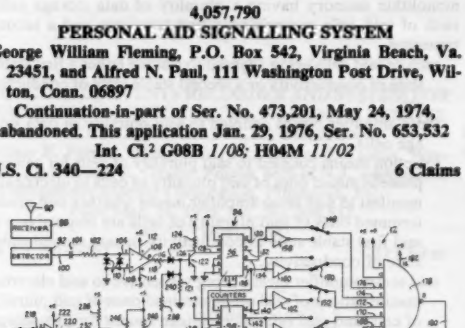
a seventh resistor connecting said emitter of said sixth transistor to said second potential;
a seventh transistor having a collector, base and emitter;
means directly connecting said emitter of said seventh transistor to said emitter of said sixth transistor;
an eighth resistor connecting said collector of said seventh transistor to said first potential;
an eighth transistor having a collector, base and emitter,
said collector of said eighth transistor being connected to said first potential source;
means directly connecting said base of said eighth transistor to said collector of said seventh transistor;
a ninth resistor connecting said emitter of said eighth transistor to said second potential;
a reference voltage source output terminal directly connected to said base of said seventh transistor and said emitter of said eighth transistor;
and means connecting said reference voltage source output terminal to said sense amplifier means, whereby the potential of said reference voltage source manifested at said reference voltage source output terminal tracks the magnitude of the electrical manifestations from said predetermined ones of said plurality of cells.

4,057,790

PERSONAL AID SIGNALLING SYSTEM

George William Fleming, P.O. Box 542, Virginia Beach, Va. 23451, and Alfred N. Paul, 111 Washington Post Drive, Wilton, Conn. 06897

Continuation-in-part of Ser. No. 473,201, May 24, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,532
Int. Cl.[2] G08B *1/08;* H04M *11/02*
U.S. Cl. 340—224 6 Claims



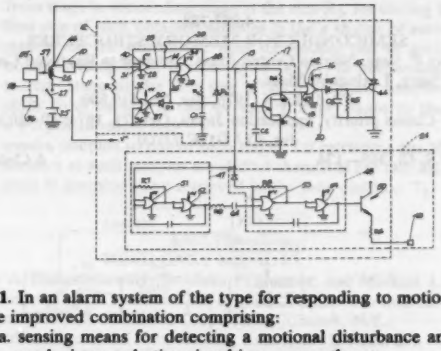
1. A personal-aid call system for activating a remote alarm signal, comprising in combination:
a. a self-contained portable transmitter adapted to be carried by a person, said transmitter generating a composite output signal characterized by a carrier frequency and a modulating frequency,
b. manual control means for enabling actuation of said transmitter, at will, by said person,
c. a receiver tuned to receive said composite signal, said receiver having a detector for demodulating the composite signal to yield a demodulated signal having a frequency characterized by a fixed relationship to that of the modulating frequency,
d. decoder means including a gated, resettable counter device of the frequency divider type,
e. means for generating a control signal which is independent of the composite output signal, to gate said frequency-divider type counter device thereby enabling the counter device over a predetermined counting interval of time,
f. said counter device being connected to the detector output of said receiver for measuring the frequency of the demodulated signal by counting consecutive, uniformly spaced cycles thereof over said predetermined counting interval of time,
g. means connected with said control signal generating means for periodically resetting the counter device to zero,
h. said counter device having a plurality of parallel, digital output terminals,
i. said decoder means including a plurality of manually selectable switches respectively connected to at least some of the digital output terminals of the frequency-divider type counter device,
j. said decoder means further including a plurality of digital inverters connected respectively in line with at least some of said counter device output terminals and connected respectively with said switches,
k. a gate having multiple inputs connected with said switches, respectively, for sensing a condition wherein there is a uniform digital voltage level on all of said gate inputs,
l. indicating means connected with said decoder means for providing an alarm when a particular modulating frequency is detected by the counter device whereby the user, when needing assistance, actuates the transmitter which in turn triggers the alarm for the purpose of alerting others to the existence of such a need, and
m. means associated with said control signal generating means for momentarily disabling the alarm during said predetermined counting interval of time, thereby preventing inadvertent actuation of the alarm while the counter device is tallying a count.

4,057,791

MOTION RESPONSIVE ALARM SYSTEM

Charles F. Bimmerle, 4399 Foley Road, Cincinnati, Ohio 45238; James R. Braig, 3235 McGill Lane, Cincinnati, Ohio 45239, and Ivars J. Vilums, 2322 Kline Ave., Cincinnati, Ohio 45211

Filed Feb. 9, 1976, Ser. No. 656,161
Int. Cl.[2] G08B *13/14*
U.S. Cl. 340—261 10 Claims



1. In an alarm system of the type for responding to motion, the improved combination comprising:
a. sensing means for detecting a motional disturbance and producing a pulsating signal in response thereto;
b. latch means connected for receiving said signal from said sensing means and having an output normally at a first logical level, said output of said latch means transitioning to a second logical level in response to the first pulse of said signal and remaining at said second logical level until said sensing means is characterized by the absence of said signal for a first predetermined time;
c. trigger means responsive to said output of said latch means for developing a trigger signal only after said output of said latch means has continuously been at said second logical level for a second predetermined time;
d. alarm means connected to said trigger means for generating an alarm signal in response to said trigger signal; and
e. a source of potential.
8. A sensor array for a motion responsive alarm comprising

a first group of motion responsive sensors, the axes of each of which are parallel to a first plane and angularly disposed from each other and a second group of motion responsive sensors the axes of each of which are parallel to a second plane and angularly disposed from each other, said second plane being perpendicular to said first plane.

4,057,792

OVERLOAD SAFETY DEVICE FOR TELESCOPIC CRANES

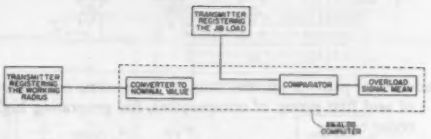
Ludwig Pietzsch, Karlsruhe; Gerd Huhne, Morsch; Knud Overlach, and Peter Fuchs, both of Karlsruhe, all of Germany, assignors to Ludwig Pietzsch, Karlsruhe, Germany

Continuation of Ser. No. 353,715, April 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 79,589, Oct. 9, 1970, abandoned. This application Feb. 11, 1975, Ser. No. 549,026

Claims priority, application Germany, Jan. 21, 1970, 2002484; Mar. 20, 1970, 2013388

Int. Cl.² G08B *21/00, 29/00*

U.S. Cl. 340—267 C **2 Claims**



1. Overload safety device for telescopic cranes comprising transmitter means for registering a working radius of a crane jib having a base jib member and transmitter means for registering a load applied to the jib, analog computer means operatively connected to both said first and second transmitter means for comparing a nominal value predetermined by the working radius with actual values furnished by the transmitter means for registering the load, and signal means responsive to a condition wherein said actual values equal said nominal value for releasing an overload signal, said nominal value being proportional to a permissible limit moment for a respective working radius, said permissible limit moment being composed of a moment of the jib weight and a moment for the permissible load, said transmitter means for registering the load being mounted on said base jib member of said crane jib and being adapted to measure the bending moment of said base jib member, a variable resistance serially connected to said bending moment measuring transmitter means, said resistance having a magnitude proportional to the variable length of said telescopic crane, and further including a fixed resistance connected in parallel with said variable resistance.

4,057,793

CURRENT CARRIER COMMUNICATION SYSTEM

Raymond E. Johnson, 705 SW. 7th St., Fort Lauderdale, Fla. 33315, and Boris Ellison, 6210 SW. 145th St., Miami, Fla. 33158

Filed Oct. 28, 1975, Ser. No. 626,071

Int. Cl.² H04M *11/04*

U.S. Cl. 340—310 R **7 Claims**

1. A current carrier communication system for selectively transmitting binary electrical signals from a first location to a second location over the AC power lines in an AC power distribution network in a building comprising:

at least first and second sources of binary electrical signals at said first location;

a first tone generating means operatively connected to said first source of binary electrical signals for generating a first tone signal at a first frequency in response to the binary electrical signal from said first source of binary electrical signals;

a second tone generating means operatively connected to said second source of binary electrical signals for generating a second tone signal at a second frequency, in response to the binary electrical signal from said second source of binary electrical signals;

linear tone summing means operatively connected to said first and second tone generating means for generating a modulating signal output that is a linear sum of said first and second tone signals;

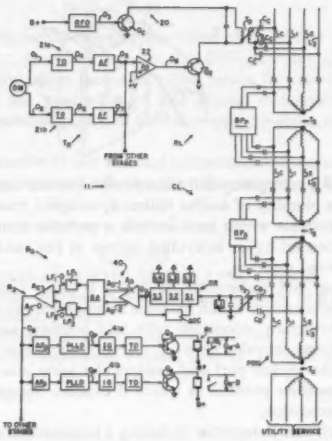
a source of RF signals operatively connected to said linear tone summing means to produce a modulated RF output signal modulated by said modulating signal output of said linear tone summing means;

transmission coupling means at said first location directly coupling said modulated RF output signal to the AC power lines;

receiver coupling means at said second location directly coupled to the AC power lines to receive said modulated RF output signal therefrom;

TRF multi-stage receiver means operatively connected to said receiver coupling means for receiving said modulated RF output signal therefrom and producing an amplified modulated RF output signal corresponding to said received modulated RF output signal;

differential signal generator means connected to said TRF receiver means for generating a first differential output signal corresponding to said RF output signal from said



TRF receiver means and a second differential output signal corresponding to said RF output signal from said TRF receiver means but with a 180° phase shift from said first differential output signal;

first demodulation means operatively connected to said first differential output signal from said differential signal generator means for demodulating said first differential output signal to produce a first demodulated output signal;

second demodulation means operatively connected to said second differential output signal from said differential signal generator means for demodulating said second differential output signal to produce a second demodulated output signal;

combining means operatively connected to said first and second demodulated output signals from said first and second demodulation means for combining said first and second demodulated output signals to eliminate even order noise therefrom present in said RF output signal and producing a composite signal output corresponding in frequency to said linearly summed modulating signal output of said linear tone summing means;

first phase locked loop detector means operatively connected to said demodulation means for detecting the presence of a tone in said composite signal output correspond-

ing to said first tone signal from said first tone generating means and generating a first detected binary electrical signal output corresponding to the binary electrical signal from said first source of binary electrical signals; and,

second phase locked loop detector means operatively connected to said demodulation means for detecting the presence of a tone in said composite signal output corresponding to said second tone signal from said second tone generating means and generating a second detected binary electrical signal output corresponding to the binary electrical signal from said second source of binary electrical signals.

4,057,794

CALLING AIDS

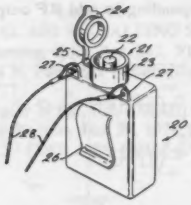
Karl Grossfield, London, England, assignor to National Research Development Corporation, London, England

Filed Apr. 2, 1975, Ser. No. 564,652

Claims priority, application United Kingdom, Apr. 4, 1974, 14968/74

Int. Cl.² H04M *11/02*

U.S. Cl. 340—311 **6 Claims**



1. An emergency-call transmission system, comprising:

a. a plurality of similar indirectly-coupled transmission subsystems which each include a portable transmitter to be carried by an individual person at risk, and a stationary sited receiver,

each said transmitter having a housing and an actuator mechanism which includes a switch part and a cover part integrally associated with said housing, said cover part being movable between a first position in which it covers the switch part and renders the same non-actuable and another position in which it exposes the switch part for actuation,

each said transmitter including a transmission signal generator of multi-element code sequence form,

each said receiver including a detector for said code sequence of the respective sub-system transmitter, and

each said receiver being separately located to define an individual zone of effectiveness for said respective transmitter; and

b. a stationary sited monitor unit including a plurality of first call indicators respectively directly connected to said receivers and operable therewith in response to said respective transmitters.

4,057,795

ANALOG-TO-DIGITAL ENCODER

Claude Timsit, Grigny, France, assignor to Association pour le Developpement de l'Enseignement et de la Recherche en Systematique Appliquee (A.D.E.R.S.A.), Velizy-Villacoublay, France

Filed Oct. 20, 1975, Ser. No. 624,124

Claims priority, application France, Apr. 22, 1974, 74.13923

Int. Cl.² H03K *13/175*

U.S. Cl. 340—347 AD **11 Claims**

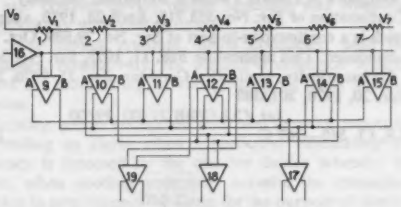
1. A high-speed analogue-to-digital encoder for converting an input analogue signal into a combination of N bits, the encoder comprising:

a first group of comparators each having a test input and a reference input;

a source of reference voltages feeding a resistive network having a plurality of series connected resistors, and connected in parallel to said reference inputs;

an input circuit for feeding an analogue voltage to be encoded in parallel to said test inputs;

at least a pair of current outputs from each said comparators of said first group for delivering a logic current signal resulting from the comparison achieved in the comparator and a logic current complementary signal for generating lower order bits;



additional pairs of current outputs from some comparators of said first group of comparators, for generating higher order bits;

a second group of comparators, each having a first and a second current inputs, and at least a current output;

said inputs of said comparators of said second group being connected to said outputs of said comparators of said first group in such a manner that each comparator of said second group delivers a bit of a predetermined order of the voltage to be encoded.

4,057,796

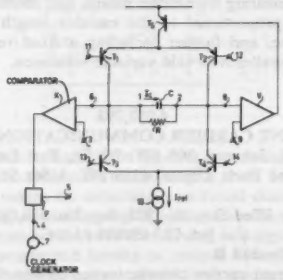
ANALOG-DIGITAL CONVERTER

Abraham Hoogendoorn; Robert Emile Johan van de Grift, and Theodorus Jozef van Kessel, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 582,310, May 30, 1975, abandoned. This application Nov. 4, 1975, Ser. No. 628,595

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 AD **14 Claims**



1. An analog-to-digital converter for converting an input analog signal comprising

a comparator having first and second inputs and an output;

a differential amplifier having first and second inputs and an output;

a capacitor having a first electrode connected to said first input of said comparator, and a second electrode to said first input of said differential amplifier;

a flip-flop, having an input connected to the output of said comparator, and an output representing the digitized form of said input analog signal;

means connected to the output of said differential amplifier for controlling the current through said capacitor;

a clock generator, for applying a clock signal to said flip-flop;

a first transistor switch controlled by said flip-flop and connected to said first electrode of said capacitor; and

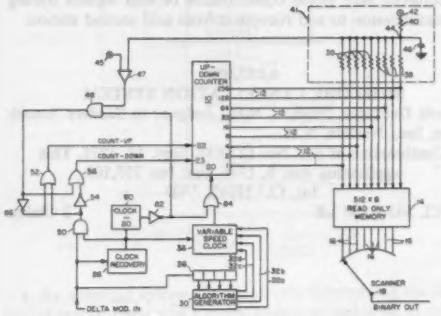
a second transistor switch connected to the second electrode of said capacitor and driven in phase opposition to said fist transistor switch by the output signal of said flip-flop.

4,057,797

ALL DIGITAL DELTA TO PCM CONVERTER

Adam A. Jorgensen, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,226
Int. Cl.² H03K *13/22*
U.S. Cl. 340—347 DD **6 Claims**



1. A digital signalling circuit for converting a delta modulated signal to a binary coded signal without producing an intermediate analog signal comprising:

a. an up-down counter having a count capacity sufficient to define uniquely a predetermined number of different quantization levels,

b. means responsive to an applied delta modulated signal for producing a clock signal having a rate equal to the maximum permitted repetition rate of pulses in the applied signal,

c. means for indexing said up-down counter responsively to both an applied delta modulated signal and the clock signal produced by said means for producing a clock signal,

d. drift correction means for biasing said counter toward its mid-value output at a rate much slower than the rate of the means for producing a clock signal, said drift correction means including means for comparing a signal proportional to the output of the counter averaged over a period very much longer than the period of the clock signal with a steady signal indicative of the mid-value output of the counter, and means for periodically indexing the counter toward its mid-value output in response to the output of said means for comparing at intervals much longer than the period of the clock signal, and

e. means for producing time divided binary coded signals in response to the successive output counts of said counter.

4,057,798

SECURITY SYSTEM

George Andrew Ellson, 6715 SW. Cherry Hill, Beaverton, Oreg. 97005

Filed Mar. 3, 1976, Ser. No. 663,464
Int. Cl.² G08B *29/00*
U.S. Cl. 340—420 **14 Claims**

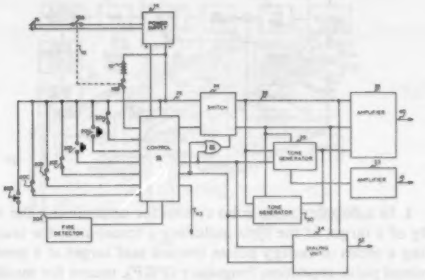
1. A system for the automatic detection of the presence of intrusion or fire within a security area, comprising:

means for sensing a fire alarm condition and including means for generating a first distinguishable signal in response to said fire alarm condition;

means for sensing an intrusion alarm condition and including means for generating a second distinguishable signal in response to said intrusion alarm condition, said means for generating including:

verification means operatively coupled to said means for sensing an intrusion alarm condition for verifying the intrusion;

first alarm means responsive to the verification of the intrusion for providing a pre-alarm signal;



second alarm means operably associated with said first alarm means for providing said second distinguishable signal, said second alarm means including means for selectively delaying the generation of said second distinguishable signal a selected period of time after said pre-alarm signal; and

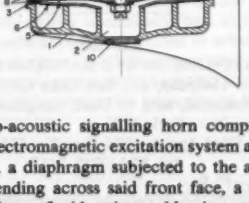
means responsive to said first and said second distinguishable signals for automatically signaling the presense of fire or intrusion.

4,057,799

ELECTRO-ACOUSTIC SIGNALLING HORNS

Bertrand Antoine Warnod, Neuilly, France, assignor to Klaxon S.A., Courbevoie, France

Filed Dec. 2, 1976, Ser. No. 746,754
Claims priority, application France, Dec. 19, 1975, 75.38952
Int. Cl.² G08B *3/10*
U.S. Cl. 340—388 **7 Claims**



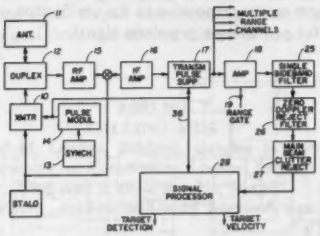
1. An electro-acoustic signalling horn comprising a case containing an electromagnetic excitation system and having an open front face, a diaphragm subjected to the action of said system and extending across said front face, a closure plate disposed at the front of said casing and having an edge portion folded over a corresponding peripheral edge portion of said case and said diaphragm to unite said case and diaphragm into an assembly, a sound box comprising a unitary element having a base wall and scroll-like wall means upstanding therefrom, a continuous edge of said wall means remote from said base wall secured to said closure plate by an adhesive, said base wall, wall means and closure plate together defining a labyrinthine passage, said sound box having a peripheral edge configuration cooperating with said edge portion of said plate.

4,057,800

MULTI-PRF SIGNAL PROCESSOR SYSTEM

Frederick M. Ganz, Head-of-the-River, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed June 1, 1976, Ser. No. 691,884
Int. Cl.[2] G01S 9/44
U.S. Cl. 343—8 **11 Claims**



1. In a doppler pulse echo system for determining the velocity of a target of the type including a transmitter for transmitting a series of energy pulses toward said target at a predetermined pulse repetition frequency (PRF), means for modifying said pulse repetition frequency at predetermined intervals, a signal processing device for processing the echo signal returned by said target to determine the doppler frequency representative of velocity of said target, the doppler frequency spectrum comprising a plurality of velocity bands of predetermined frequency width, said processing device comprising:

a doppler filter bank including a plurality of filter circuits each filter circuit responsive to a predetermined band of frequencies at each PRF,

a plurality of signal threshold devices, each connected to a different one of said filter circuits,

means for applying a signal derived from said echo return to said filter bank,

memory means for storing data sets comprising the identities of the specific threshold device producing an output signal and the PRF of the transmitted signal at which said threshold output is produced,

means for converting the first data set at one PRF to one of said velocity bands,

means for converting another data set at a different PRF to one of said velocity bands,

means for determining from said velocity bands a single unambiguous velocity band which satisfies each of said data sets,

means for determining the target velocity according to the doppler frequency represented by said unambiguous velocity band.

4,057,801

CONTINUOUS-WAVE RANGING SYSTEM

James Eugene Holladay, Jr., Salt Lake City, and Billie Mike Spencer, Bountiful, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,808
Int. Cl.[2] G01S 9/37
U.S. Cl. 343—12 R **10 Claims**

1. A continuous wave-ranging system, comprising in combination;

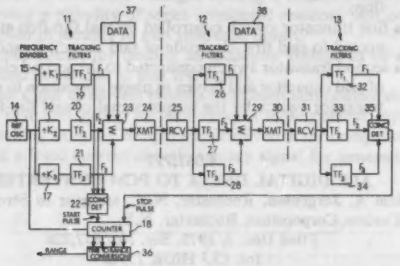
a first station including first means for providing three sinusoidal signals which coincide in phase repetitively at equal intervals,

said first station including second means for transmitting and third means for receiving said signals,

a second station disposed at an unknown distance from said first station,

said second station including fourth means for receiving and transmitting said signal back to said first station,

said first station including fifth means responsive to said second means and said third means for detecting phase coincidences of said signals and for measuring the time



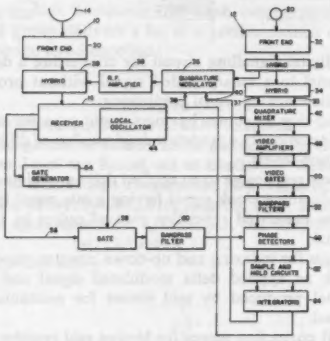
between said phase coincidences of said signals during transmission to and reception from said second station.

4,057,802

SIDELOBE CANCELLATION SYSTEM

Kenneth Dollinger, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 612,433, Sept. 11, 1975. This application Jan. 5, 1976, Ser. No. 757,109
Int. Cl.[2] H04B 7/00
U.S. Cl. 343—100 LE **3 Claims**



1. Apparatus for cancelling sidelobe interference energy, comprising:

a primary antenna for receiving a signal which may include a desired signal and an interfering signal;

an auxiliary antenna for receiving a signal including primarily said interfering signal;

means coupled to said primary antenna for substantially cancelling said interfering signal;

a correlator coupled to said primary and auxiliary antennas for generating a signal indicative of the difference between the signals applied thereto:

first bandpass filtering means coupling said primary antenna to said correlator;

second bandpass filtering means coupling said auxiliary antenna to said correlator;

said first and second bandpass filtering means having a frequency response such as to exclude at least the main lobe of the radar pulse spectrum of the desired signal; and

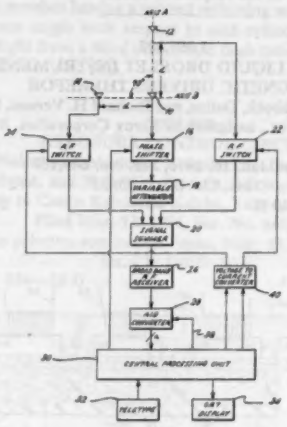
means coupling the outut of said correlator to said cancellation means.

4,057,803

ADAPTIVE DIRECTION OF ARRIVAL ANTENNAE SYSTEM

Ernest W. Coleman, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1976, Ser. No. 674,716
Int. Cl.² G01S 3/48; H01Q 3/26
U.S. Cl. 343—113 R 10 Claims



1. An antennae system for adaptively determining the direction of arrival angle α of a signal source, comprising, in combination:

first, second and third antennae fixed in a right triangle configuration for receiving the signal source and for producing respective output signals indicative of said source:

phase shifting means having a first input connected to receive the output signal from the respective one of said antennae fixed at the right angle apex of said configuration and for producing a phase shifted output signal upon receipt of a control signal at a second input;

means connected to receive the phase shifted output signal, output signals from the respective others of said antennae and control signals for alternatingly summing said phase shifted output signal with selected ones of the other antenna output signals according to the receipt of said control signals and for producing summed output signals indicative thereof;

detecting means connected to receive the summed output signals for detecting the levels thereof and for producing an output indicative of said levels; and

processing means connected to provide said control signals to said phase shifting means second input and to said summing means and connected to receive the detecting means output for calculating the antenna pattern null angles θ of orthogonal pairs of said antennae according to the equation

$$\theta = \cos^{-1}\frac{180 - \psi}{90}$$

wherein ψ = the phase angle of the summed output signals having the lowest output level and the antennae in each of said pairs are separated by one quarter wavelength, and for producing the direction of arrival angle of the signal source according to the equation

$$\alpha = \tan^{-1}\frac{\cos\theta_1}{\cos\theta_2}$$

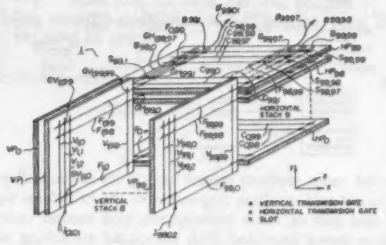
wherein θ_1 = the null angle of one orthogonal antennae pair and θ_2 = the null angle of the other orthogonal antennae pair.

4,057,804

BRANCHED PATH COMMUNICATIONS APPARATUS FOR ROUTING COMMUNICATIONS SIGNALS

William Raymond Holme, Brampton, Canada, assignor to Holme Communications Systems, Inc., Canada

Continuation-in-part of Ser. No. 383,408, July 27, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,830
Claims priority, application Canada, Aug. 11, 1975, 233242; June 21, 1973, 174682
Int. Cl.² H04L 5/00
U.S. Cl. 343—200 17 Claims



1. A path routing arrangement for use in a frequency division branched path carrier communications system, said path routing arrangement comprising:

a. an integer number N of first transmission tracks and an equal number of second transmission tracks;

b. branched path means interconnecting said first transmission tracks and said second transmission tracks in a branched path manner for selectively providing a desired carrier transmission path between a preselected one of said first transmission tracks and a preselected one of said second transmission tracks whereby a desired transmission path through said path routing arrangement is defined for a first communications carrier having a predetermined first carrier frequency and propagating in a first direction along the defined path and for a second communications carrier having a predetermined second carrier frequency and propagating in the opposite direction along the defined path; said second carrier frequency being different than said first carrier frequency by a predetermined amount; said branched path means including an integer number N of third transmission tracks defining branching paths between said first transmission tracks and said second transmission tracks; said desired transmission path being a transmission path defined by said preselected transmission tracks and a unique one of said third transmission tracks which is interconnected with said preselected first and second tracks; each of said transmission tracks and any carrier transmission path so defined being electrically unbalanced and shielded to substantially confine communications carriers propagating therein and allowing communication carriers gaining access thereto to propagate in and energize the transmission track or path, as the case may be.

4,057,805

RADIO-CONTROLLED MACHINE POWER CUT-OFF

Donald Hugh Dowling, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

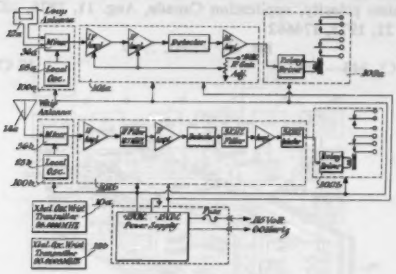
Filed Mar. 30, 1976, Ser. No. 672,030
Int. Cl.² H04B 7/00
U.S. Cl. 343—225 6 Claims

1. A radio-controlled machine power safety cut-off comprising

a pair of battery-powered radio transmitters adapted for individual wear on the wrists of the machine operator,

a first radio receiver means having its antenna disposed at a danger zone of said machine responsive to the predeter-

mined magnitude of a broadcast signal emitted by either or both of said radio transmitters signalling intrusion of said radio transmitters closer than a preselected safe distance, said first radio receiver being provided with associated switching means cutting off the operating power of said machine, upon occurrence of said intrusion, and



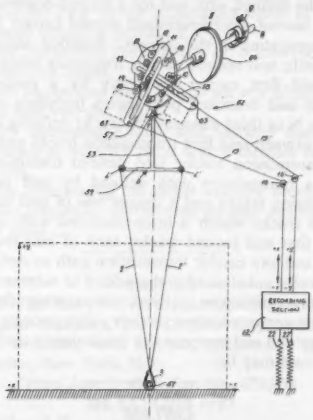
a second radio receiver means having its antenna disposed adjacent said machine responsive to the broadcast signals of said pair of radio transmitters, said second radio receiver being provided with associated switching means cutting off the operating power to said machine whenever either or both of said radio transmitters fails to emit said broadcast signals.

4,057,806

APPARATUS FOR ANALYZING MOVEMENTS OF AN ANIMATE OR INANIMATE OBJECT

Vassil Lazarov Furnadjiev, Sofia, and Boris Krestanov Samardjiev, Plovdiv, both of Bulgaria, assignors to CS na BSFS, Sofia, Bulgaria

Filed July 2, 1976, Ser. No. 702,186
Claims priority, application Bulgaria, July 2, 1975, 30438
Int. Cl.² G01D *5/02, 9/30*
U.S. Cl. 346—33 R **6 Claims**



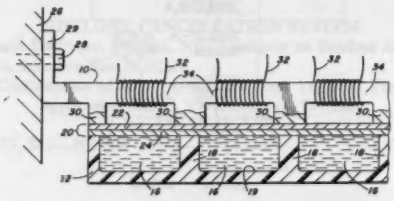
1. In an apparatus for analyzing movements of a prescribed object, a holder for carrying the object, a shaft having front and rear ends and exhibiting a splined outer surface at its front end, torsion-applying means coupled to the shaft and supporting the shaft for bi-directional rotation under load about a first axis, a first disc fixedly supported on the shaft, a second disc fixedly supported on the shaft forwardly of the first disc and disposed around the forward splined end of the shaft, a T-shaped element having a central arm secured to and extending outwardly from the second disc, first and second strands individually extending from a prescribed point of the holder to the periphery of the first disc through the respective ends of the crossarm of the T-shaped element for effecting a rotation of the shaft upon a movement of the holder, first and second racks each having internal teeth, means carried by the second disc for individually supporting the first and second racks in toothed engagement with the splined front end of the shaft for movement in mutually perpendicular directions, and recording means associated with the first and second racks for generating separate indicia instantaneously indicative of the then-occurring movements of the respective racks.

4,057,807

SEPARABLE LIQUID DROPLET INSTRUMENT AND MAGNETIC DRIVERS THEREFOR

Kenneth H. Fischbeck, Dallas, and Richard H. Vernon, Richardson, both of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1976, Ser. No. 649,187
Int. Cl.² G01D *15/18*
U.S. Cl. 346—140 R **10 Claims**



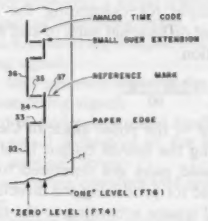
1. In a liquid drop generator comprising: a housing having a plurality of pressure chambers therein, said pressure chambers opening onto an outer surface of said housing and elastic diaphragm means sealing each chamber opening thereby forming an outer wall of a respective chamber; driver unit means having a plurality of members permeable to magnetic fields, said housing releasably secured to the driver unit means" each of said permeable members releasably engaging a portion of said elastic diaphragm means of a respective one of said chambers; means for selectively effecting a magnetic field in each of said permeable members; said elastic diaphragm means being so constructed and arranged to deform to decrease the volume of a respective chamber in response to said effected magnetic field.

4,057,808

RECORDING APPARATUS

Donald E. Shafer, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 2, 1976, Ser. No. 692,131
Int. Cl.² G01D *9/42;* **B41B** *13/00*
U.S. Cl. 346—107 R **6 Claims**



1. A light box matrix having a plurality of interior compartments and an exterior face in which a plurality of slits are arranged in a recording array, a plurality of flash tubes, means for mounting one of said flash tubes in individual ones of said

compartments, an opaque member mounted in another of said compartments, said opaque member being configured to provide light tight isolation of said flash tubes from each other, said opaque member having a cylindrical opening therein to direct light from one of said flash tubes to pass to and through a first one of said slits, said opaque member having a first reflecting surface disposed at a first angle with respect to said cylindrical opening to reflect light from a second one of said flash tubes to and through a second one of said slits, said opaque member having a second reflecting surface disposed at a different angle with respect to said cylindrical opening to reflect light from a third one of said flash tubes to and through a third one of said slits.

4,057,809

EXPOSURE CONTROL CIRCUIT

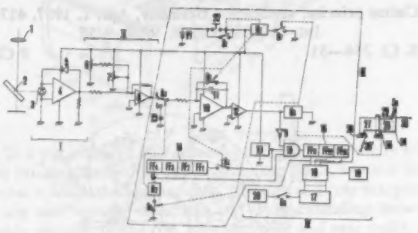
Soichi Nakamoto, Machida; Tadashi Ito; Fumio Ito, both of Yokohama, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1976, Ser. No. 666,458

Claims priority, application Japan, Mar. 18, 1975, 50-32616

Int. Cl.[2] G03D 7/08

U.S. Cl. 354—23 D **15 Claims**



1. An exposure control device comprising:
a. a first circuit for converting an exposure factor into an analog signal which represents the exposure factor,
b. an analog-digital converter for converting said analog signal into a digital signal, said analog-digital converter including:
1. an integrating circuit for integrating an input signal to produce a time-variable output signal having a slope dependent upon the input signal level,
2. an analog signal source having an analog signal of a predetermined reference level and of opposite polarity to that of the analog signal of said first circuit,
3. changeover means for applying selectively either of the analog signals of said first circuit and said analog signal source to said integrating circuit,
4. a control circuit for controlling operation of said changeover means in such a manner that after a predetermined time interval from the time of application of the analog signal from said first circuit to said integrating circuit, said control circuit produces an output which actuates said changeover means to cause the application of the analog signal from said analog source to said integrating circuit,
5. a pulse generator for producing pulses at a predetermined frequency,
6. counter means for counting pulses,
7. gate means responsive to the output of said control means to pass the pulses from said pulse generator to said counter means, and
8. output detecting means coupled to the output terminal of said integrating circuit upon attainment of the output of said integrating circuit to a predetermined level for producing an output; and
c. exposure control means coupled to said counter means for controlling the amount of exposure of a photographic film in accordance with the content of said counter means corresponding to the number of pulses counted by said counter means.

4,057,810

EXPOSURE CONTROL SYSTEM

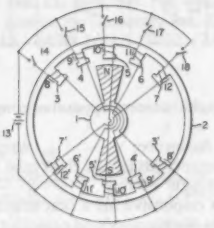
Hiroshi Iwata, Osaka, Japan, assignor to West Electric Co., Ltd., Japan

Filed Aug. 13, 1975, Ser. No. 604,246

Claims priority, application Japan, Aug. 20, 1974, 49-96438; Oct. 18, 1974, 49-20899

Int. Cl.[2] G03B 7/14

U.S. Cl. 354—29 **8 Claims**

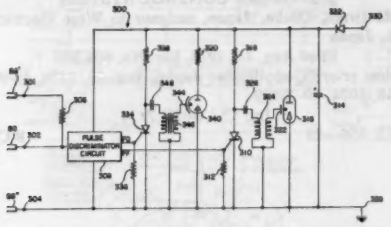


1. An exposure control system comprising
a plurality of shutter blades which also function as the diaphragn blades,
a driving device comprising
a stator having a plurality of pairs of angularly separated opposed poles, field coils mounted on each pair of stator poles, and
a rotor having a pair of poles one of which is magnetized to the N pole and the other is magnetized to the S pole, and positioned stationarily between one of said pairs of poles, which is located at the center of poles when said shutter blades are closed, means operatively connecting said rotor to said shutter blades;
a plurality of switches, each connected to a different pair of said opposed field coils, switch selection means responsive to a control signal for selectively actuating different ones of said switches or pairs of said switches connected to adjacent field coils to establish a magnetic field within said stator at an angle having a one-to-one correlation with the value defined by said control signal, said magnetic field interacting with said rotor poles to generate a driving force to rotate said rotor into alignment with said magnetic field,
aperture setting means responsive to the brightness of a subject for providing said control signal for actuating said switch selection means, said control signal being provided to said switch selection means prior to the actuation of said switches or pairs of switches by said selection means, thereby causing said shutter blades to define a predetermined aperture depending upon the brightness of said subject,
exposure time setting means responsive to the brightness of said subject for controlling the operating time of said switch selection means; thereby controlling the opening time of said shutter blades depending on the brightness of said subject, and
electrical power supply means for providing current to said switches, whereby said shutter blades are driven to define a predetermined aperture for a predetermined time depending upon the brightness of a subject, thereby attaining the optimum exposure.

4,057,811
QUENCH STROBE WITH PREDETERMINED QUENCH RATE

George C. Harrison, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 2, 1976, Ser. No. 720,005
Int. Cl.[2] G03B 15/05
U.S. Cl. 354—33 8 Claims

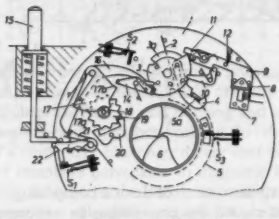


1. A photographic camera apparatus comprising
a housing;
an electronic flash tube;
a capacitor for energizing said flash tube to cause said flash tube to emit light energy;
trigger means responsive for a first select output signal for initiating the discharge of said capacitor through said flash tube thereby energizing said flash tube;
means for mounting an objective lens on said housing;
means associated said housing for receiving a source of electrical energy;
means within said housing for defining a film exposure plane;
a blade assembly mounted and arranged within said housing for displacement from an initial closed arrangement, wherein said assembly precludes scene light from impinging on said exposure plane to a second arrangement wherein said blade assembly defines a maximum aperture through which scene light is permitted to impinge on said exposure plane and then to a final closed arrangement wherein said blade assembly again precludes scene light from impinging on said exposure plane, such a displacement of said blade assembly serving to define an exposure interval during which scene light is incident upon said film exposure plane;
scene light detecting means energizable by the source of electrical energy for providing an output signal in correspondence to the amount of scene light detected subsequent to the commencement of an exposure interval;
means, at least in part energizable by the source of electrical energy, for initiating the displacement of said blade assembly from its said initial closed arrangement towards its said second arrangement thereby commencing said exposure interval and for providing said first select output signal to trigger the discharge of said capacitor through said flash tube subsequent to the intiating of the exposure interval, and then responsive to said output signal of said scene light detectingmeans reaching a predetermined value, for effecting the displacement of said blade assembly into its final closed arrangement in anticipation of the amount of exposure influencing light which is admitted by said blade assembly before reaching said final closed arrangement under generally steady state scene lighted conditions and for providing a second select output signal; and
means responsive to said second select output signal for quenching said energizing flash tube by discharging said capacitor at a predetermined rate corresponding directly to the rate at which the light energy emitted by said flash tube is quenched, said discharging means including a switching element triggerable in correspondence with said second select output signal and a resistive element in series connection with respect to said switching element, said switching element and resistive element exhibiting, when triggered, a collective impedance which operates to discharge said capacitor at a rate providing for a select amount of exposure influencing artificial illumination to be emitted by said flash tube subsequent to the initial appearance of said second select output signal, said select amount of exposure influencing artificail illumination substantially corresponding to said amount of exposure influencing light which is admitted by said blade assembly subsequent to said scene light detecting means reaching said predetermined value under generally steady state scene lighted conditions.

4,057,812
CAMERA SHUTTER HAVING AN ELECTRONIC TIMING DEVICE

Waldemar T. Rentschler; Franz W. R. Starp, and Karl Helber, all of Calmbach, Black Forest, Germany, assignors to Prontor-Werk Alfred Gauthier GmbH, Wildbad, Black Forest, Germany

Continuation of Ser. No. 716,487, March 27, 1968, abandoned, and Ser. No. 111,629, Feb. 8, 1971, abandoned, and Ser. No. 299,179, Oct. 19, 1972, abandoned, and Ser. No. 492,099, July 26, 1974, abandoned. This application Apr. 14, 1976, Ser. No. 676,763
Claims priority, application Germany, Apr. 1, 1967, 41782
Int. Cl.[2] G03B 7/08, 9/08, 9/58
U.S. Cl. 354—51 8 Claims



1. Timing arrangement for controlling the operation of a camera shutter blade system comprising
actuatable shutter blade drive means including movable means arranged upon actuation of the drive means to carry out an opening movement and thereafter a closing movement for operating the shutter blade system,
a timing circuit containing a photo-electric resistor and associated capacitor for controlling the duration of the shutter exposure time as determined by the photo-electric resistor,
a charge starting contact actuatable to commence the timing operation of said timing circuit and operatively arranged for immediate actuation by said movable means upon initial actuation of the driving means and before the opening movement is carried out,
an electromagnetically actuated locking device energizable by the timing circuit upon actuation of the charge starting contact and including mechanical locking means arranged with respect to the drive means for mechanical movement from a normally locking position prior to actuation of the drive means to an unlocking position upon de-energization of the locking device and in the locking position said locking means being operatively connected to the drive means to hold the shutter blade system open for the duration of the exposure time as determined by said photo-electric resistor after the opening movement and before the closing movement of the movable means, the mechanical movement of the mechanical locking means from the locking position to the unlocking position taking a determinable amount of time, and
a mechanical brake device arranged for direct braking contact with the movable means after initial actuation of the drive means and immediate actuation of the charge starting contact and in turn commencement of the timing

operation of the timing circuit to delay the opening movement of the movable means by an initial offsetting amount of time which selectively pre-compensates for the corresponding determinable amount of time taken by the mechanical locking means of the electromechanically actuated locking device to move from the locking position to the unlocking position thereof upon de-energization by the timing circuit in order for the closing movement of the movable means to be carried out.

4,057,813

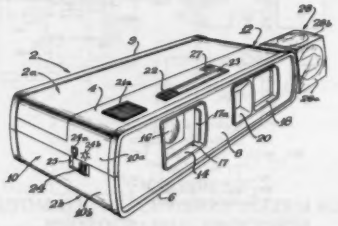
POCKET SIZED CAMERA

Ib Penick, 18 E. Willow Road, Wheeling, Ill. 60090

Division of Ser. No. 346,288, March 30, 1973, abandoned. This application Nov. 12, 1975, Ser. No. 631,062

Int. Cl.[2] G03B *15/03*

U.S. Cl. 354—144 **6 Claims**



1. In a pocket-sized still camera having a horizontally elongated housing formed by top and bottom walls, vertical front and rear walls extending between the front and rear margins of said top and bottom walls, and end walls extending between the side margins of the top, bottom, front and rear walls, the top and bottom walls of the housing being closely spaced relative to the front to back dimensions thereof and to the spacing between said housing end walls, to provide a relatively thin and narrow camera housing elongated in the direction between the end walls thereof and which can be readily placed in a shirt pocket when oriented so the longitudinal axis thereof is vertically oriented, said front wall having an opening behind which the camera lens means is located; exposed manually operable trigger means for operating shutter mechanism on the camera; a flash unit-receiving member mounted for rotation into a number of different operative stable positions and having an outer flash unit-receiving end exposed to the outside of the housing and adapted to support a multilamp flash unit having a number of flash lamp and reflector sections spaced around a central axis of symmetry thereof coextensive with the axis of rotation of the flash unit-receiving member, and exposed manually operable film winding means for advancing the film in the camera one frame position after the taking of a picture, the improvement wherein said flash unit-receiving member is positioned at one of said end walls of the housing so the axis of rotation of the flash unit-receiving member extends horizontally or transversely from the housing end wall, so the multilamp flash unit supported therein has its central axis of symmetry similarly extending horizontally or transversely of said housing end wall in a direction of the longitudinal dimension of the camera housing and the camera with the flash unit attached can be positioned comfortably in a shirt pocket or the like, there is provided exposed manually operable flash operation on-off control means operable at least when the flash unit is mounted in said flash unit-receiving member for movement between "on" and "off" positions, flash unit operating means in the housing responsive to the movement of the flash on-off control to the "on" position for rendering the flash lamp section in front of the flash unit supported on the flash unit-receiving member operative upon operation of said manually operable trigger means, said flash unit being inoperative when the flash on-off control is in its "off" position even when the flash unit is mounted on said flash unit-receiving member, whereby the multilamp flash unit need not be removed from the flash unit-receiving member if a flash operation is not desired, and flash unit rotation means responsive to the operation of said manually operable film winding means for effecting rotation of the flash unit-receiving member in a given direction to the next stable position thereof only in response to the first film winding operation after a picture is taken when the flash on-off control is in its "on" position and independently of the actual position of the flasher on-off control at the time the film winding operation takes place.

4,057,814

SUB-MINIATURE CAMERA CONSTRUCTION

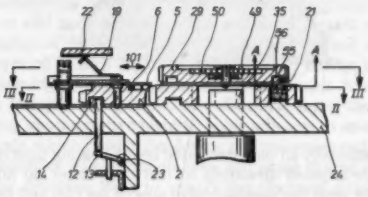
Martin Grünbacher, and Hans Werner Johannsen, both of Braunfels, Germany, assignors to Firma Minox GmbH, Giessen, Germany

Filed Jan. 12, 1976, Ser. No. 648,362

Claims priority, application Germany, Jan. 22, 1975, 2502364

Int. Cl.[2] G03B *17/42, 19/02, 17/36*

U.S. Cl. 354—204 **15 Claims**



1. In a camera, the combination of a rotatable winding knob to move film in the camera and to cock a shutter of an objective, a slide operatively connected to said winding knob and displaceable between initial and end positions, a spring connected to said slide to urge the slide into the initial position, a release button blocked from actuation by said slide in its inital position and released for actuation when the slide is in its end position, means co-acting between said release button and said slide for releasing said slide for displacement to its initial position under action of said spring upon actuation of said release button, and electric contact means closed by said slide returning to its initial position for actuating a circuit to operate a shutter of a camera.

4,057,815

ANTI-FLARE STRUCTURE FOR PHOTOGRAPHIC OPTICAL SYSTEM

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 9, 1975, Ser. No. 620,924

Int. Cl.[2] G03B *17/02*

U.S. Cl. 354—288 **23 Claims**

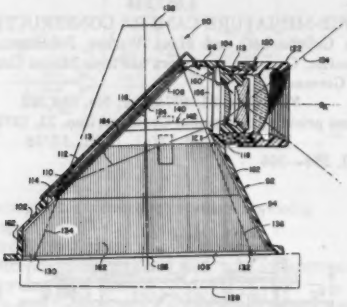
1. Photographic apparatus comprising:

means for defining an image plane at which a film unit having a photosensitive area of given dimensions may be positioned for exposure;

an objective lens assembly, having a given field in object space, for directing image-bearing light rays from a scene being photographed onto the entire photosensitive area of the film unit when the film unit is positioned at said image plane to record an image of the scene thereon, said objective lens assembly and the photosensitive area of the film cooperating to define a field of view of said photographic apparatus which is smaller than said field of said objective lens assembly; and

an opaque enclosure structure having an outlet aperture disposed in optical alignment with the film unit's photosensitive area and an inlet aperture in optical communica-

tion with said objective lens assembly, said objective lens assembly being configured and arranged with repsect to said opaque enclosure structures so that unwanted image-bearing light rays originating within said field of said objective lens assembly but outside said field of view of said photographic apparatus enter said enclosure structure through its said inlet aperture, said enclosure structure comprising internal light-absorbing specularly reflective wall surfaces including portions located and oriented to initially intercept substantially all such unwanted image-bearing light rays and to redirect initial reflections of



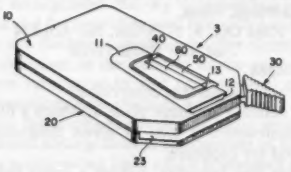
substantially all such unwanted image-bearing light rays in predetermined directions so that they either do not impinge upon the photosensitive area of the film unit or only impinge upon the photosensitive area of the film unit after undergoing a plurality of additional reflections from said internal wall surfaces sufficient to dissipate their energy to a point below which they will not adversely effect the photographic quality of the image recorded thereon, said internal wall surfaces including a plurality of serrated wall surfaces comprising juxtaposed converging wall surfaces for reflecting therebetween certain of such unwanted image-bearing light rays to dissipate their energy.

4,057,816

ACCESSORY ADAPTER

John C. Killian, Jr., Sudbury, and John B. Morse, Boston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 13, 1976, Ser. No. 648,724
Int. Cl.[2] F16M *11/04*; G03B *17/00*
U.S. Cl. 354—293 **4 Claims**



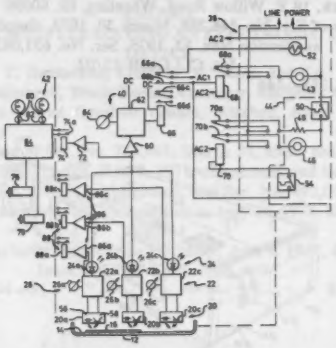
1. An adapter for securing a photographic accessory having a tripod screw to a camera having a dovetail slot, comprising a housing, means forming a tripod socket in said housing, a dovetail shoe mounted on said housing and adapted to extend into the dovetail slot in the camera, means forming an aperture in one side of said dovetail shoe, a lock slide, means mounting said lock slide in said aperture for movement between a first position within the confines of said dovetail shoe and a second position beyond the confines of said shoe, a resilient element mounted on said lock slide in position to engage the dovetail slot in said second position of said lock slide, and cam means for moving said lock slide between said first and second positions.

4,057,817

FILM PROCESSOR STANDBY CONTROL SYSTEM

A. Norman Korb, Portland, and Rex L. Breunsbach, Mulino, both of Oreg., assignors to Lok-A-Bin Systems, Inc., Portland, Oreg.

Filed Nov. 7, 1975, Ser. No. 629,997
Int. Cl.[2] G03D *13/00*
U.S. Cl. 354—298 **15 Claims**



12. In combination, a film processor and a standby unit for controlling the operating mode of said processor such that said processor is normally maintained in a low energy consuming standby mode and is switched to a high energy consuming processing mode only for a predetermined processing period in response to the presence of a film in the infeed tray of said processor,

said processor including water-circulating means, a drive motor and a film-drying chamber including a blower means, a heater and a main thermostat controlling the operation of said heater and blower means,

said standby unit including electrically operated processor control means normally operable to maintain said processor in its standby mode wherein said drive motor is deactivated and said blower means and heater are deactivated, a timer means for controlling the operation of said processor control means, film detector means for detecting the presence of a film in said infeed tray and timer-activating means for activating said timer means for a predetermined period in response to a sensing of a film in said tray by said detector means,

said detector means comprising infrared light emitter means positioned above said tray and directed toward said tray for reflecting an infrared light beam from an upper surface of said tray or a film in said tray and means positioned and operable for sensing the reflected beam and differentiating between said beam when reflected from said tray surface and when reflected from said film surface by producing a variable level detection signal representative of said differentiation, and triggering means for producing a control signal in response to the application of said detection signal to said triggering means at a threshold level indicative of the presence of a film in said tray, and means for operating said timer means in response to the application of said control signal, said timer means being operable when activated to operate said processor control means in a manner to switch said processor from its standby mode to its processing mode for said predetermined period during which said drive motor, blower means and heater are activated and controlled by said main thermostat,

said processor including a water flow-restricting valve means in said water-circulating means with said restricting valve means having a flow-restricting position and a full

flow position, said processor control means being operable with said timer means deactivated to maintain said flow-restricting valve means in said flow-restricting position, said processor control means being operable with said timer means activated to operate said restricting valve means in its said full flow position,

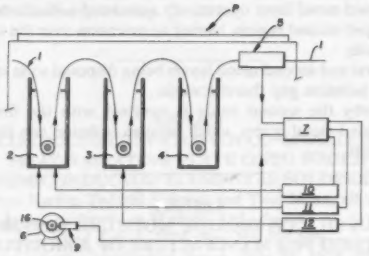
said film-drying chamber including auxiliary thermostat means having a lower temperature operating range than said main thermostat, said auxiliary thermostat being operable in the standby mode of said processor to operate said processor control means intermittently to activate said heater and said blower means to raise the temperature within said drying chamber when said temperature drops below a predetermined minimum level during said standby mode, said processor control means remaining operable to operate said heater and blower means until said auxiliary thermostat recloses upon the raising of the temperature within said drying chamber within an acceptable standby temperature range.

4,057,818

AUTOMATIC REPLENISHER SYSTEM FOR A PHOTOGRAPHIC PROCESSOR

Alfred J. Gaskell, Hopkins, and Ralph L. Charnley, Minneapolis, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed June 25, 1975, Ser. No. 590,078
Int. Cl.² G03D *13/00*
U.S. Cl. 354—298 **11 Claims**



1. An automatic replenisher system for photographic film processors of the type having a liquid confining processing tank and a conveyor system defining a film path extending through the tank and therebeyond, said system comprising,

a normally deenergized replenisher pump for supplying replenishing liquid to the tank,

means for automatically periodically energizing the pump at predetermined intervals regardless of the density of the film processed in said tank,

light-sensitive film density scanning means positioned in the film path beyond the tank for measuring the image density of the processed film and for producing an electrical control signal responsive to the density of said processed film,

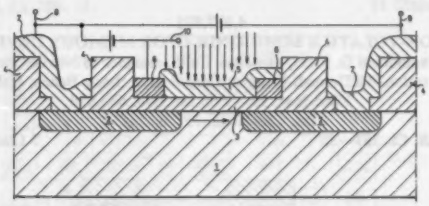
comparator circuit means receiving said signal for comparing the same to a reference signal and de-energizing said replenisher pump as a function of the comparing, whereby the time duration between energizing and de-energizing is a function of measured image density of the processed film.

4,057,819

SEMICONDUCTOR DEVICE

Alan Ernest Owen, 19 Tantallon Place, Edinburgh 9, Scotland, and John Mavor, 20 Ellen's Glen Road, Edinburgh EH17 7QP, Scotland

Filed Aug. 5, 1976, Ser. No. 711,873
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 **10 Claims**



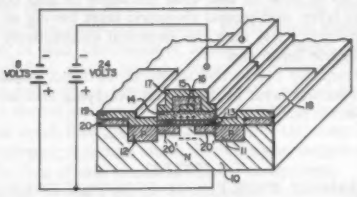
1. A bistable illumination-sensitive switch device comprising a semiconductor body, a first electrode and a second electrode in or on said body between which a channel current can flow in a region of the body adjacent to a surface thereof, a dielectric layer on at least a part of said surface, a charge injecting photosensitive material on said dielectric layer having the ability to inject charges into said dielectric layer, the charge injecting photosensitive material being adjacent to an auxiliary electrode which, while the device is illuminated and electrically biased in an appropriate way will cause charge injection into the dielectric layer to modify the electrical condition of the dielectric layer and affect the channel current flowing in the semiconductor body after the illumination ceases.

4,057,820

DUAL GATE MNOS TRANSISTOR

Robert C. Gallagher, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 29, 1976, Ser. No. 701,049
Int. Cl.² H01L *29/78, 27/02, 29/34, 29/04*
U.S. Cl. 357—23 **8 Claims**



1. An MNOS memory transistor, comprising in combination:

a. a semiconductor substrate of a first conductivity type having first and second regions of a second conductivity type therein, said first and second regions extending to a common surface of said substrate to form a drain, a source and a channel therebetween;

b. at least a first insulating structure including a substantially uniform layer disposed on said common surface overlying and substantially coextensive with said channel, said uniform layer being operative at times to trap charges;

c. a first electrically conductive layer disposed on and overlying only a portion of said insulating structure and said channel inwardly of the inner edges of the source and drain to form a first gate;

d. a second electrically conductive layer overlying substantially the remaining portions of said insulating structure

and the portions of said channel outwardly of the first gate to form a second gate; and

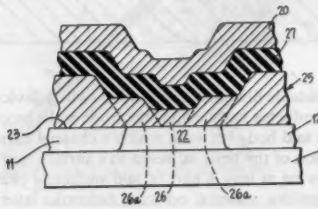
e. means for applying electrical signals to said first and second regions of opposite conductivity types, said substrate, and said first and second gates, said means being operative to cause said uniform layer to trap charges in response to predetermined electrical signals applied to the first and second gate and substrate.

4,057,821

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

Pramodbhai D. Patel, San Jose, Calif., assignor to Nitron Corporation/McDonnell-Douglas Corporation, Long Beach, Calif.

Filed Nov. 20, 1975, Ser. No. 633,879
Int. Cl.[2] H01L *29/78, 29/34*
U.S. Cl. 357—23 **7 Claims**



1. An insulative gate field effect transistor comprising a semiconductive substrate of a first conductivity type; a pair of spaced semiconductive diffusion regions of opposite conductivity type to said first conductivity type, said diffusion regions being separated by an interstitial portion of said substrate and sharing a common boundary surface therewith; a field oxide layer adhered to said common boundary surface, said layer having a minimum thickness in the region thereof overlying said interstitial portion and a substantially greater thickness in the remaining regions thereof; a composite dielectric layer having a total thickness in the range from about 450A °± 50A to about 850A °± 50A and including a first layer adhered to said oxide layer and a second layer adhered to said first layer, said first dielectric layer having a thickness in the range from about 20% to about 50% of said total thickness of said composite dielectric layer, said second dielectric layer having an electrical conductivity less than the electrical conductivity of said first dielectric layer; and

an electrically conductive electrode in direct contact with said second layer in the region overlying said interstitial substrate portion.

4,057,822

CHANNEL TYPE PHOTO-ELECTRIC ENERGY TRANSDUCER

Kenryo Watanabe, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1975, Ser. No. 605,843
Claims priority, application Japan, Aug. 22, 1974, 49-96712
Int. Cl.[2] H01L *29/34*
U.S. Cl. 357—52 **4 Claims**

1. An energy transducing semiconductor device comprising:

a semiconductor wafer of one conductivity type;

a first channel region of the other conductivity type opposite to that of the semiconductor wafer;

a junction barrier disposed between the wafer and the first channel region;

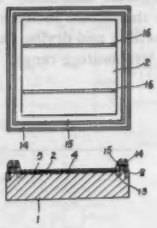
a first oxide disposed over the first channel region to protect the junction barrier against the outside ambient atmosphere;

a heavily doped first region having the same conductivity as that of the wafer, disposed so as to surround the peripheral portion of the wafer;

a heavily doped second region having the same conductivity as that of the first channel region, disposed so as to surround the peripheral portion of the junction barrier, the heavily doped second region having a looped structure inside of the heavily doped first region so as to define a closed loop, said heavily doped second region having a looped structure having at least one conductive bridging portion extending from one point on said looped structure to another point thereon disposed over the first oxide;

a second oxide disposed over the wafer in the space between the heavily doped first section and the heavily doped second region;

a second channel region of the same conductivity type as the first channel region disposed between the second oxide and the wafer, said second channel region being of such low concentration that leakage current between it and the heavily doped first region surrounding the peripheral portion of the wafer is substantially avoided, whereby dark current through the semiconductor device is determined only by leakage current between the wafer and the first channel region;



a first metal layer operatively associated with the heavily doped first region, having an extension over the second oxide;

a second metal layer operatively associated with the heavily doped second region, having an extension over the second oxide;

the first and second metal layers being disposed so as to have an isolation gap therebetween;

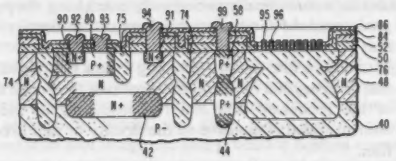
whereby the second oxide is overlaid with the first and second metal layers which have an isolation gap therebetween.

4,057,823

POROUS SILICON DIOXIDE MOISTURE SENSOR AND METHOD FOR MANUFACTURE OF A MOISTURE SENSOR

Paul Johannes Burkhardt, Poughkeepsie, and Michael Robert Poponiak, Newburgh, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 2, 1976, Ser. No. 701,788
Int. Cl.[2] H01L *29/34, 23/16, 23/36*
U.S. Cl. 357—52 **13 Claims**



1. A moisture sensor comprising a monocrystalline silicon body;

a region within the said body of high porosity silicon dioxide;

a metal counter electrode on a part of said porous silicon dioxide area; and

said porous silicon dioxide having a porosity sufficient that ambient moisture can quickly diffuse into the porous silicon dioxide under the said electrode, adsorb onto the silicon dioxide surface and cause measurable changes in the said device.

4,057,824

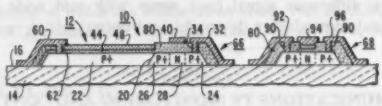
P+ SILICON INTEGRATED CIRCUIT INTERCONNECTION LINES

Murray Henderson Woods, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,148

Int. Cl.² H01L *27/12, 29/78, 29/34, 29/06*

U.S. Cl. 357—56 **14 Claims**



1. In combination with a plurality of heteroepitaxial silicon mesa devices on a common substrate, at least one of said mesa devices comprising a first doped region and a second differently doped region, an improvement comprising:

a means for interconnecting one of said regions of said at least one mesa device to another of said mesa devices, said means comprising a P+ silicon region having a first insulating coating thereon and a second insulating coating means for preventing oxidation of said P+ silicon region, said second insulating coating being located adjacent said first insulating coating.

4,057,825

SEMICONDUCTOR DEVICE WITH COMPOSITE METAL HEAT-RADIATING PLATE ONTO WHICH SEMICONDUCTOR ELEMENT IS SOLDERED

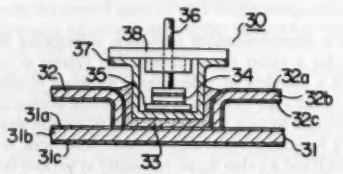
Kazutoyo Narita; Tadashi Sakaue, and Yuzi Niino, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed July 1, 1976, Ser. No. 701,809

Claims priority, application Japan, July 18, 1975, 50-87293; Sept. 19, 1975, 50-112623

Int. Cl.² H01L *23/02, 23/28*

U.S. Cl. 357—81 **10 Claims**



1. A semiconductor device comprising a semiconductor element soldered to a metal heat-radiating plate, in which said metal heat-radiating plate consists of a first metal layer for providing mechanical strength and second metal layers disposed on both sides of said first metal layer, for serving as a thermal and electrical conducting medium, and said semiconductor element is soldered onto one of said second metal layers.

4,057,826

SYNC RESPONSIVE SYSTEMS FOR VIDEO DISC PLAYERS

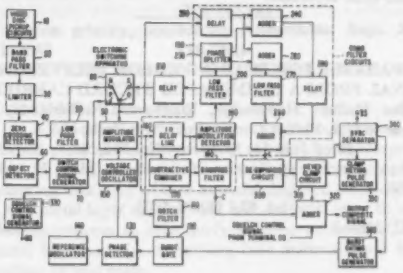
Alfred Lynn Baker, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed June 26, 1975, Ser. No. 590,485

Claims priority, application United Kingdom, Nov. 18, 1974, 49925/74

Int. Cl.² H04N *5/785, 9/02*

U.S. Cl. 358—4 **11 Claims**



1. In disc record playback apparatus including a pickup system for recovering from a disc record carrier waves frequency modulated in accordance with a composite color video signal, said composite color video signal including a deflection synchronizing component and picture signal components comprising a luminance signal component occupying a given frequency band and a chrominance signal component sharing a portion of said given frequency;

frequency demodulation apparatus responsive to a carrier wave output of said pickup system for developing a demodulated signal output substantially confined to said given frequency band;

a source of oscillations at a frequency above said given frequency band;

means for modulating the amplitude of oscillations from said source in accordance with said demodulated signal output of said frequency demodulation apparatus;

first comb filter means, including a 1H delay line having an input receiving an output of said modulating means, for developing a first comb filtered signal output substantially free of said chrominance signal component, said first comb filter means having a frequency response characteristic exhibiting a plurality of regularly spaced nulls over said shared portion of said given frequency band;

second comb filter means, including said 1H delay line, for developing a second comb filtered signal output substantially free of said luminance signal component;

means for deriving a delayed composite color video signal from said 1H delay line;

means for identifying departures from a given frequency deviation range of the instantaneous frequency of the signals supplied to said frequency demodulation apparatus;

means responsive to the output of said departure identifying means for altering the operation of said modulating means during said departures so that the amplitude of said oscillations from said source is modulated in accordance with said delayed composite color video signal provided by said deriving means, in place of the signal output of said frequency demodulation apparatus;

a de-emphasis circuit responsive to said first comb filtered signal output of said first comb filter means for developing a de-emphasized signal output, said de-emphasis circuit having a frequency response characteristic exhibiting a declining response with increase in input frequency over a portion of said given frequency band;

an adder, responsive to respective outputs of said de-empha-

sis circuit and of said second comb filter means, for forming a composite color video signal output; and

means for recovering said deflection synchronizing component to the substantial exclusion of other components of said signal output of said frequency demodulation apparatus; said recovering means comprising a sync separator having an input, and means, independent of said adder and responsive to an output of said de-emphasis circuit, for coupling a de-emphasized version of said first comb filtered signal output of said first comb filter to said input of said sync separator.

4,057,827

APPARATUS FOR READING COLOR TELEVISION SIGNAL FROM A DISC-SHAPED RECORD CARRIER

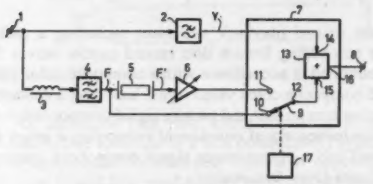
Adrianus Huibert Hoogendijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 14, 1975, Ser. No. 595,708

Claims priority, application Netherlands, May 21, 1975, 7505938

Int. Cl.² H04N 5/76

U.S. Cl. 358—8 **4 Claims**



1. An apparatus for reading a disc-shaped record carrier on which a color television signal is recorded in adjacent tracks, of the type provided with a scanning unit for scanning the record carrier, a decoding device for converting the signal read from the record carrier with the aid of the scanning unit into a standard PAL type color television signal, and a command device for selectively repeating the scanning of predetermined frames of the television signal recorded on the record carrier, the improvement wherein the decoding device is provided with a correction circuit, which comprises an input terminal for receiving a color television signal derived from the read-out signal, a first filter connected to said input terminal for extracting the luminance signal contained in said color television signal, a second filter connected to said input terminal for extracting the chrominance signal contained in said color television signal, a delay means connected to said second filter for delaying the extracted chrominance signal by one line period, a signal controlled recombination circuit means connected to said first filter and to said delay means and controlled by the command device for selectively providing at an output terminal an output signal composed of the luminance signal and the chrominance signal of the color television signal applied to the input terminal and in response to the repetition of a predetermined frame providing an output signal composed of the luminance signal applied to the input terminal and the chrominance signal extracted from the color television signal applied to said input terminal and delayed by one line period.

4,057,828

CONTRAST COMPRESSION CIRCUITS

John F. Monahan, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Filed Nov. 17, 1975, Ser. No. 632,181

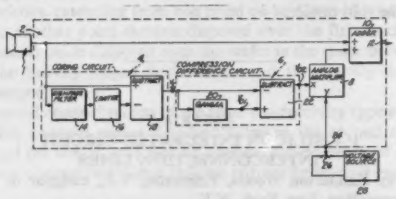
Int. Cl.² H04N 9/53, 5/20, 5/535

U.S. Cl. 358—32 **5 Claims**

1. An amplitude compression circuit for de-emphasizing variations in amplitude of a wide band electrical signal, comprising:

coring means responsive to said wide band signal for noise reduction of said signal by high frequency coring to produce a noise filtered signal;

difference signal source means responsive to said noise filtered signal for producing a compression difference signal corresponding to the difference between said noise filtered signal and an amplitude compressed said noise filtered signal; and,



signal adder means for additively combining said compression difference signal back again with said wide band signal to produce a de-emphasized output signal.

4,057,829

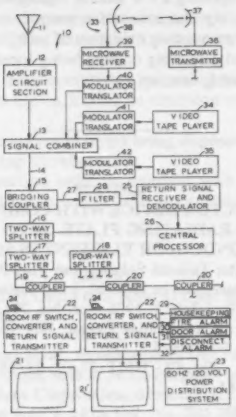
COMMUNICATIONS TV MONITORING AND CONTROL SYSTEM

Robert M. Moorehead, Richardson, Tex., assignor to Spectradyne, Inc., Richardson, Tex.

Continuation-in-part of Ser. No. 425,254, Dec. 18, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,315

Int. Cl.² H04N 7/18

U.S. Cl. 358—86 **11 Claims**



1. In a communications television monitoring and control system for a video signal distribution system constructed to transmit a plurality of video signal program channels from a head end through a common cable section connected through a distribution section to a plurality of television sets at various viewing locations: a plurality of control devices, including an RF switch and a video signal converter at various television set locations; a plurality of return RF signal transmitters, each connected for message activation by an associated one of said RF switches with one of said plurality of control devices; with said RF signal transmitters connected to feed message RF signaling, including preassigned RF signal transmitter location message signalling, back through said video signal distribution system when said RF switch is switched to a message activate state with video channel selection; and, return RF signal receiver means connected to said video signal distribution system for receiving return RF signals from said plurality of return RF

signal transmitters for application to central message processing means.

4,057,830

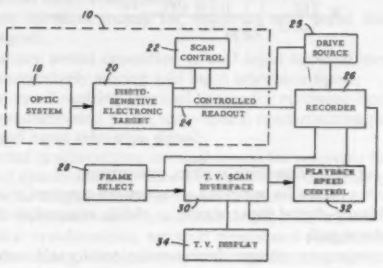
ELECTRONIC PHOTOGRAPHY SYSTEM

Willis A. Adcock, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 543,106, Jan. 22, 1975, abandoned, which is a continuation of Ser. No. 460,396, April 12, 1974, abandoned, which is a continuation of Ser. No. 266,826, June 27, 1972, abandoned. This application Oct. 29, 1976, Ser. No. 736,975

Int. Cl.[2] H04N *5/78, 7/18*

U.S. Cl. 358—127 8 Claims



1. An electronic still picture photography system comprising:

a. an electronic camera with an optical electronic transducer means having data storage capability for storing an instantaneous optical image and a scanner which scans said transducer means at a relatively slow rate to read a stored image from the data storage of said transducer means;

b. a recording apparatus having a record head coupled to said transducer means for recording, in analog form, single image still pictures received from the transducer means on selected portions of a magnetic recording medium including means for passing said magnetic recording medium past said record head at a first relatively slow velocity to record each of said single image still pictures;

c. a television receiver type display device for visually displaying said still pictures; and

d. a playback apparatus having means for selecting a recorded single image still picture to be displayed and a read head for reading the selected single image still picture from said magnetic recording medium including means for passing said magnetic recording medium past said read head at a relatively higher velocity than said recording medium passes said record head in said recording apparatus; wherein

e. the rate of the scanner of said electronic camera is compatible with the first relatively slow velocity at which still pictures are recorded on said magnetic recording medium and the rate at which said still pictures are read from said magnetic recording medium is compatible with the scan rate of the scanner of said display device to effect a stationary display of said optical image.

4,057,831

VIDEO RECORD DISC MANUFACTURED BY A PROCESS INVOLVING CHEMICAL OR SPUTTER ETCHING

Bernardus Antonius Johannus Jacobs; Johannes van der Wal, and Gerrit Berend Gerritsen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 527,245, Nov. 26, 1974, abandoned, which is a division of Ser. No. 344,865, March 26, 1973, Pat. No. 3,894,179, which is a continuation-in-part of Ser. No. 344,636, March 26, 1973, abandoned. This application Aug. 11, 1976, Ser. No. 713,521

Claims priority, application Netherlands, Sept. 5, 1972, 7212045

Int. Cl.[2] B32B *3/00;* C23C *15/00;* G11B *11/12, 25/04;* H04N *5/86*

U.S. Cl. 358—128 4 Claims

1. A disc-shaped information carrier comprising a disc-shaped plate and a substantially spiral information-providing track on a surface of said plate produced by subjecting a tightly adhering thin layer of base material disposed on said plate and a thin metal layer coating said base material layer to a sputter etching process to selectively remove portions of the thin metal layer and the underlying base material layer from the surface of said plate.

4,057,832

APPARATUS FOR READING A DISK-SHAPED RECORD CARRIER WITH TRACK JUMPING FOR CHARGING MOTION EFFECTS

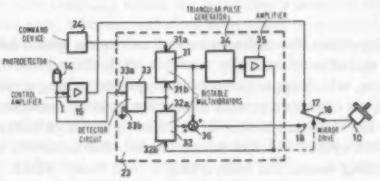
Hermanus Antonius Kappert, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1975, Ser. No. 628,594

Claims priority, application Netherlands, Aug. 21, 1975, 7509906

Int. Cl.[2] H04N *5/76*

U.S. Cl. 358—128 8 Claims



1. Apparatus for reading a disk-shaped record carrier on which information is recorded in optically coded form in tangentially extending tracks, which apparatus is of the type comprising a radiation source means for producing a read beam of radiation, a directing system means for making a scanning spot produced by said read beam of radiation on the record carrier cooperate with a desired track, a read detector means for converting the information contained in said read beam after cooperation with the record carrier into an electrical signal, a measuring detector means for measuring the radial position of the scanning spot relative to the desired track, and for supplying a corresponding control signal to the directing system, and a switching device means for causing the scanning spot to effect a jump-wise displacement from a track being followed to an adjacent track in response to a start signal, which switching device comprises a signal source means for supplying a control signal which is suitable for causing said jump-wise displacement to the directing system, which control signal consists of two consecutive signal periods of mutually substantially the same duration and substantially the same shape, but of opposite polarity, the improvement wherein the switching device includes a detection circuit means for detecting the instant at which the scanning spot is displaced half-way between two adjacent tracks during the jump-wise displacement and for at that instant supplying a detection signal to the

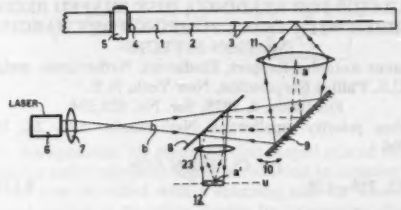
signal source, and wherein said signal source means comprises means for supplying a control signal whose two signal periods have a duration which automatically substantially equals the time interval between the start signal and the detection signal.

4,057,833

CENTERING DETECTION SYSTEM FOR AN APPARATUS FOR PLAYING OPTICALLY READABLE RECORD CARRIERS

Josephus Johannes Maria Braat, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 530,165, Dec. 6, 1974, Pat. No. 3,962,720. This application Mar. 23, 1976, Ser. No. 669,639
Claims priority, application Netherlands, Jan. 28, 1976, 7600842
Int. Cl.² H04N 5/76; G11B 7/12
U.S. Cl. 358—128 6 Claims



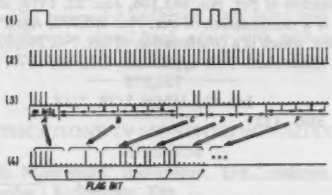
1. Apparatus for reading a record carrier on which information is stored in an optically readable track-shaped information structure, which apparatus is of the type comprising a radiation source, an objective system means for passing radiation emitted by the radiation source to a radiation-sensitive information detection system via the record carrier, the detection system comprising means for converting a read beam which is supplied by the radiation source and modulated by the information structure into an electrical signal, and which apparatus furthermore comprises a centering detection system which is connected to an electronic circuit for deriving a control signal for correcting the centering of the read beam relative to a track portion to be read, the improvement wherein the centering detection system and the information detection system are constituted by an even number of at least two and at most four radiation-sensitive detectors which are situated in the far field of the information structure in separate quadrants of an imaginary X-Y coordinate system, whose origin is disposed on the optical axis of the objective system and whose X-axis effectively extends in the track direction and whose Y-axis effectively extends transversely to the track direction, that the outputs of two detectors which are disposed at the same side of the Y-axis are connected to both a subtractor circuit and an adder circuit, that a multiplier circuit is provided to whose inputs signals derived from the subtractor circuit and from the adder circuits are applied, and that the output of the multiplier circuit is connected to a filter circuit which only transmits frequencies lower than the frequency which corresponds to twice the average spatial frequency of the information structure in the track direction, at the output of which filter circuit a control signal for correcting the centering of the read beam is obtained.

4,057,834

SIGNAL COMPRESSION SYSTEM FOR BINARY DIGITAL SIGNALS

Yukio Nakagome, Yokohama; Hiroichi Teramura, Tokyo; Yasuo Fukata, Mitaka, and Yasuhiro Yamasaki, Machida, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 459,848, April 10, 1974, abandoned. This application July 18, 1975, Ser. No. 597,403
Claims priority, application Japan, Apr. 12, 1974, 49-40831; July 25, 1973, 48-83071
Int. Cl.² H04N 7/12
U.S. Cl. 358—133 3 Claims



1. A signal compression system, comprising:

sampling means for sampling at successive constant intervals a binary digital input signal to obtain a sampled binary pulse signal;

first temporary storage means connected to said sampling means for successively storing therein a predetermined number of bits of the sampled binary pulse signal which constitute a block of bits;

bit change detecting means connected to said first temporary storage means for producing either a non-detecting output signal or a detection output signal when no bit is detected or when any bit change is detected, respectively, by comparing each of the bits in a block of bits stored in the first temporary storage means with the last bit of a block of bits immediately preceding in time the block of bits stored in said first temporary storage means;

second temporary storage means connected to said first temporary storage means and said bit change detecting means for storing therein in response to said detection output signal, in a parallel signal configuration, the bits which are stored in said first temporary storage means and transferred to this second temporary storage means at intervals of said predetermined number of bits;

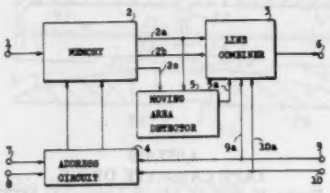
coding means connected to said bit change detecting means for coding only the duration of the bits in which no bit change is detected as represented by said non-detecting output signal and for developing a coded pulse signal representative of the detected duration; and

signal interlacing means connected to said temporary storage means and said coding means for interlacing said coded pulse signal, or the contents of said second temporary storage means when it contains a blocks of bits having a bit change, with at least one sign bit discriminating them from each other to produce a converted output, so that said coded pulse signal is included in the compressed output in response to said non-detection output signal of said bit change detecting means.

4,057,835
SYSTEM FOR CONVERTING NUMBER OF LINES OF TELEVISION SIGNAL

Koji Kinuhata, Tokyo; Kitsutaro Amano, Yokohama; Hiroshi Sasaki, Kashiwa, and Hideo Yamamoto, Sagamihara, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed June 29, 1976, Ser. No. 701,035
Claims priority, application Japan, Sept. 27, 1975, 50-116847
Int. Cl.² H04N *5/02*
U.S. Cl. 358—140 **3 Claims**



1. A system for converting the number of lines of an input television signal having frames each formed by two adjacent interlaced fields comprising:

input terminal means for receiving said input television signal:

memory means connected to said input terminal means for successively storing said input television signal;

first synchronizing terminal means for receiving horizontal synchronizing pulses and vertical synchronizing pulses of said input television signal;

second synchronizing terminal means for receiving horizontal synchronizing pulses and vertical synchronizing pulses of an output television signal to be obtained;

address circuit means connected to said memory means, said first synchronizing terminal means and said second synchronizing terminal means for performing the write-in operation to the memory means in response to said horizontal synchronizing pulses and said vertical synchronizing pulses of the first synchronizing terminal means and for performing the read-out operation from the memory means in response to said horizontal synchronizing pulses and said vertical synchronizing pulses of said second synchronizing terminal means;

detection means connected to said memory means for detecting from the contents of said memory means, moving picture areas of said frames each formed by a block of successive moving picture elements, each of which has a level difference more than a predetermined threshold level from the level of a corresponding picture element in an immediately preceding frame of said input television signal, and for generating a moving area detection signal in response to each detection of said moving picture areas;

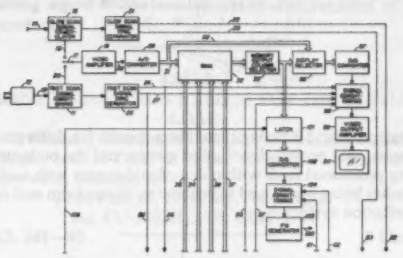
line combiner means connecting said memory means, said detection means and said second synchronizing terminal means for forming each interlaced frame of said output television signal by signals of two adjacent fields of said input television signal read-out from said memory means in response to said moving area detection signal, said horizontal synchronizing pulses of said second synchronizing terminal means under a condition where signals of each field of said each frame of said output television signal are formed by sequentially weighting and combining line signals of the former and the latter of the two fields of said input television signal, so that the order of lines is not reversed in said output frame while the lines are not repeated in the same field, and under a condition where the weight factor of said weighting and combining is constant for said moving picture area but variable for each stational picture area other than said moving picture area in accordance with a distance between an instant line signal of said output frame and a line signal of the same field to be combined with said instant line signal; and

output terminal means connected to said line combiner means for obtaining said output television signal.

4,057,836
SLOW SCAN TELEVISION SCAN CONVERTER

Clarence Jennings Munsey, Lakeside, Calif., assignor to Robot Research, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 651,517, Jan. 22, 1976, abandoned, which is a continuation of Ser. No. 571,084, April 24, 1975, abandoned. This application Jan. 7, 1977, Ser. No. 758,019
Int. Cl.² H04N *7/12*
U.S. Cl. 358—140 **10 Claims**



1. A system for storing video information at both a slow scan rate and a fast scan rate, and for retrieving video information signals from said stored information at both the slow scan rate and the fast scan rate, comprising:

a random access memory for storing information provided by digital video information signals;

an addressing means for addressing a selected location in the memory;

slow scan counting means for providing a count at the slow scan rate, wherein said slow scan count is provided to the addressing means for indicating a said selected location to be addressed in the memory when either storing or retrieving information at the slow scan rate;

fast scan counting means for providing a count at the fast scan rate, wherein said fast scan count is provided to the addressing means for indicating a said selected location to be addressed in the memory when either storing or retrieving information at the fast scan rate; and

address selection control means responsive to the fast scan counting means for causing the addressing means to address said selected locations in the memory indicated by the count provided by the fast scan counting means during intervals corresponding to one line of video information provided at the fast scan rate, and to address said selected locations in the memory indicated by the count provided by the slow scan counting means during blanking intervals between said video line intervals.

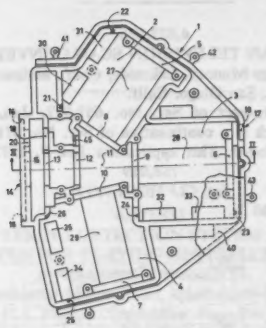
4,057,837
TELEVISION CAMERA COMPRISING A RIGID HOUSING

Howard Curtis Needs, and Harald Henricus Cornelis Maria Spapens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,546
Claims priority, application Netherlands, Feb. 19, 1975, 7501931
Int. Cl.² H04N *5/64*
U.S. Cl. 358—254 **12 Claims**

1. A television camera comprising more than one pick-up tube each having a given axis and an entrance optical system including an optical distribution system having a given axis, the entrance optical system and the pick-up tubes being situated in

a plane containing the axis of the optical system with the axes of each of the pick-up tubes intersecting the axis of the optical system and one another, two walls extending parallel to said plane, a plurality of partition walls forming with said two walls



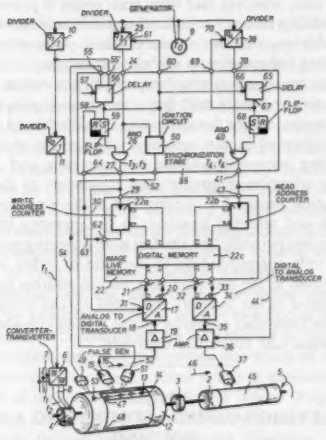
an integral rigid housing, providing spaces for different components, said optical distribution system and the pick-up tubes being positioned each within one of said spaces with said pick-up tubes being positioned to receive an image from said optical distribution system.

4,057,838

PROCESS AND APPARATUS FOR EXACTLY ADJUSTING THE BEGINNING AND END OF REPRODUCING IN AN ENGRAVING UNIT

Juergen Doelves, and Dieter Herforth, both of Kiel, Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Germany

Filed Mar. 25, 1976, Ser. No. 670,405
Claims priority, application Germany, Mar. 25, 1975, 2513042
Int. Cl.[2] H04N *1/26*
U.S. Cl. 358—299 **7 Claims**



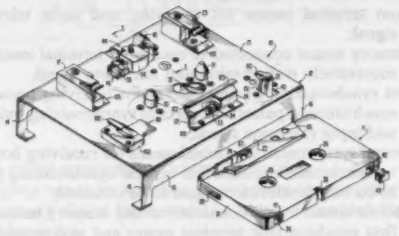
6. Apparatus for adjusting the beginning and ending of reproduction of an image pattern mounted on a rotating scanning cylinder onto a rotating recording cylinder by means of a circumferential pulse comprising, means for adjusting the delay of a signal, a forward-backward counter which has a forward counting-input and backward counting-input which are alternately loaded with a first counting pulse sequence signal train in order to count in or out a number of pulses of said first counting pulse sequence signal train, a backwards counter which receives the output data of said forward-backward counter for accepting the counter reading and having an acceptance input which is connected to a signal source in order to initiate the acceptance of the counter reading with the signal, a coding circuit for encoding a counter reading of the backwards counter connected to the data output of said backwards counter whereby said coding circuit emits the delayed signal when the counter reading is reached, a switch, said backwards counting-input of the backwards counter is loadable with a second counting pulse sequence signal train through said switch and said switch can be switched on by said signal and switched off by said delayed signal.

4,057,839

TAPE CASSETTE DRIVE

Frank H. Banks, Wakefield, Mass., assignor to MFE Corporation, Salem, N.H.

Filed Dec. 22, 1975, Ser. No. 643,324
Int. Cl.[2] G11B *15/48;* G06K *7/14;* G11B *5/08*
U.S. Cl. 360—93 **15 Claims**



1. A tape drive for a tape cassette wherein the cassette includes a substantially rectangular cassette housing containing first and second reels of tape and means for guiding the tape past a series of openings formed along a leading edge of the cassette and formed in surfaces normal to the leading edge adjacent thereto, the tape having an aperture formed therein, said tape drive comprising:

A. a frame member,

B. first and second motor drive spindles mounted to said frame member for driving the tape cassette reels,

C. transducer means mounted to said frame member to contact the tape through a first of the tape cassette openings,

D. a radiant energy source for directing radiant energy into the tape cassette through a second of the tape cassette openings along a radiant energy axis which intersects the plane of the tape and which passes through a third of the tape cassette openings, and

E. means for sensing the radiant energy including

i. a sensor housing having a longitudinal cavity formed therein along a cavity axis which intersects the radiant energy axis,

ii. a radiant energy detector mounted in said cavity on the cavity axis and displaced from the radiant energy axis,

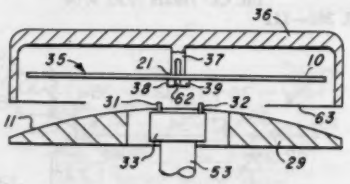
iii. means in said cavity for redirecting the radiant energy received along the radiant energy axis to parallel the cavity axis, and

iv. first and second spaced fingers extending from said sensor housing and interfitting the third cassette opening thereby to accommodate the tape, said fingers guiding the tape and blocking ambient light from reaching said detector.

4,057,840
FLEXIBLE DISC RECORDING CARTRIDGE

Dale Tackitt Wingo, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 7, 1976, Ser. No. 647,023
Int. Cl.[2] G11B 5/016, 3/60; G01D 15/24
U.S. Cl. 360—99 11 Claims

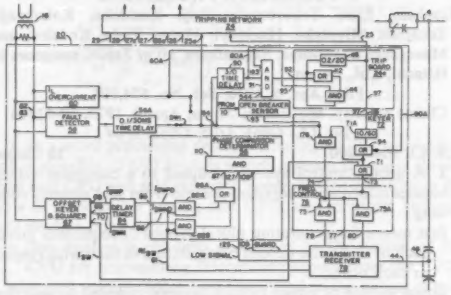


1. A flexible disc cartridge comprising:
a. flexible disc shaped member having upper and lower opposite major surfaces and a centrally located opening extending from said upper major surface to said lower major surface with a magnetic field responsive layer formed on said upper major surface;
b. a housing with said disc shaped member being contained within said housing;
c. a retaining member affixed to said housing and extending through the centrally located opening of said disc shaped member for retaining said disc shaped member with said disc shaped member being free to rotate on said retaining member, said housing having;
d. a first opening opposite said lower major surface for receiving a rotational means which rotates said disc shaped member about said retaining member; and
e. a second opening opposite said upper major surface for receiving a recording and/or reading head which records and/or reads tracks of information by means of the magnetic field responsive layer on the upper major surface of said disc shaped member.

4,057,841
UNSUPERVISED TRIP KEYING FOR PHASE COMPARISON RELAYING APPARATUS

Walter L. Hinman, Jr., New Providence, and Russell W. Gonnam, Morris Plains, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1976, Ser. No. 716,048
Int. Cl.[2] H02H 3/28
U.S. Cl. 361—64 4 Claims

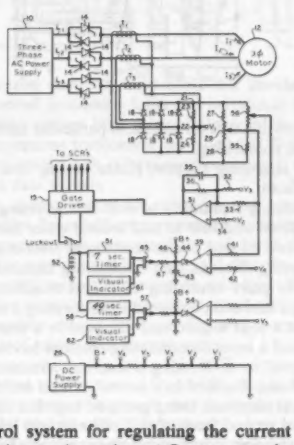


1. In phase comparison relaying apparatus for protecting an alternating current power transmission line including at least one conductor interconnected by circuit breaker means at its local and remote end terminals between first and second busses, the improvement comprising:
a. first circuit means, cooperatively associated with one end terminal of the conductor, adapted to receive signals representative of current flow in the conductor at both of its end terminals, for comparing said signals and for generating a breaker trip enabling signal whenever the received signals have a predetermined relationship;
b. second circuit means, adapted to receive said trip enabling signal, for forwarding said trip enabling signal to the associated interconnecting circuit breaker means, said second circuit means being further adapted to receive at least one arming signal representative of an undesirable current condition in the conductor and to inhibit forwarding of said trip enabling signal only in the absence of said arming signal; and
c. third circuit means also adapted to receive said breaker trip enabling signal for forwarding said breaker trip enabling signal to the non-associated end terminal of the conductor.

4,057,842
CURRENT REGULATION SYSTEM FOR THREE-PHASE LOAD

Bruce K. Bauman, Glen Rock; Dean K. Norbeck, and Donald L. Tollinger, both of York, all of Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 28, 1976, Ser. No. 652,915
Int. Cl.[2] H02H 3/08; G05F 1/44
U.S. Cl. 361—93 3 Claims



1. A control system for regulating the current flow at a desired level from a three-phase AC power supply to a three-phase load, comprising:
coupling means, including three line conductors, for coupling the three-phase AC power supply to the threephase load to supply three load currents thereto;
three wye-connected current transformers, each of which is coupled to a respective one of said three line conductors, for sensing the three load currents and developing currents proportional to the load currents;
a three-phase full wave bridge circuit, having an output resistor, for rectifying and adding the currents, developed by said current transformers, to produce an output voltage signal across said resistor,
the center of said wye-connected transformers and one terminal of said output resistor being interconnected and held at a fixed reference potential in order that any current imbalance between the three load currents is reflected at full relative magnitude across said output resistor, said output voltage signal being proportional to the greatest of the three load currents;
means, including a potentiometer, coupled to said output resistor for developing a feedback signal proportional to

said output voltage signal, the desired level of the three load currents being set by adjusting said potentiometer;

comparison means, including a differential amplifier, for comparing said feedback signal with a reference signal to produce an error signal proportional to the difference between the two compared signals;

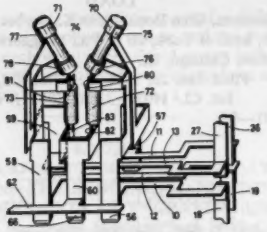
and control means, coupled to said coupling means, responsive to said error signal for adjusting the amplitudes of the three load currents in order to maintain them at the desired level.

4,057,843

CABLE CONNECTION UNITS AND PROTECTION DEVICES

Yves Saligny, Cluses, France, assignor to Etablissements Carpano & Pons SA, Cluses, France

Filed Apr. 9, 1976, Ser. No. 675,484
Claims priority, application France, Apr. 25, 1975, 75.13088
Int. Cl.² H02H 3/22
U.S. Cl. 361—104 **17 Claims**



1. A connection unit for cables, in particular telecommunications cables, comprising:

a pile of insulating support plates having first and second outer faces;

means defining a plurality of orifices traversing said pile of plates from said first to said second outer face;

at least some of said plates carrying at least one preformed conducting element, said conducting elements being disposed in pairs consisting of a first conducting element having a first end connected to or forming a lead-in terminal and a bent second end disposed in a first of said orifices, and a second conducting element having a first end connected to or forming a lead-out terminal and a bent second end disposed in a second of said orifices;

said lead-in terminals being grouped together on one of said first and second faces of said pile and said lead-out terminals also being grouped together on one of said first and second faces of said pile, for connection of lines of a cable;

a grounding circuit disposed adjacent said first face of said pile;

said bent second ends of said first conducting elements being bent towards said first face and being dimensioned and prestressed to tend to come into contact with corresponding parts of said grounding circuit;

each pair of said first and second orifices receiving said second ends of a pair of first and second conducting elements being associated with a third said orifice;

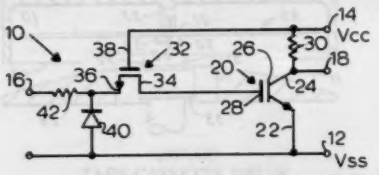
and at least one plug module comprising means for electrically connecting and protecting a pair of said lead-in and lead-out terminals, said module comprising first, second and third parallel plug pins pluggable in said second face of said pile in associated first, second and third orifices whereby said first plug pin contacts said bent second end of said first conducting element and holds it out of contact with said grounding circuit, said second plug pin contacts said bent second end of said second conducting element and said third plug pin contacts a corresponding part of said grounding circuit, said module comprising means for electrically connecting said first and second plug pins and a lightning protector connected between said first and third plug pins.

4,057,844

MOS INPUT PROTECTION STRUCTURE

Sean Anthony Smedley, Saratoga, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed June 24, 1976, Ser. No. 699,527
Int. Cl.² H02H 7/20, 9/04
U.S. Cl. 361—111 **1 Claim**



1. An input protection device for a V-groove field effect transistor formed in a monolithic semiconductor substrate with a source region therein, base region therein overlying said source, and drain region overlying said base region, at least one V-groove extending into the substrate exposing the base region, an insulative layer overlying the exposed portion of the base region, at least one gate conductor overlying at least a portion of the insulative layer and power supply means connected between said drain and said source through load means, said device comprising

a planar field effect transistor formed on said substrate and having its own source, its own drain and its own insulated gate electrode,

signal input means for connecting an input signal to said V-groove transistor, said input means being in electrical interconnection with the source of said planar transistor,

the drain of said planar transistor being in electrical interconnection with said gate conductor of said V-groove transistor,

the insulated gate electrode being in electrical interconnection with said power supply means, and

said source of said planar transistor being formed in said substrate in a manner that defines it as a protective diode at a junction of said source and said substrate and at the same time as an input resistor extending from the region of said insulated gate electrode to said signal input means.

4,057,845

GROUP CONTROL SYSTEM FOR VISUAL INFORMATION PROCESSING

Masakazu Ejiri, Tokorozawa; Seiji Kashioka, Kokubunji; Takafumi Miyatake, Hachioyi; Haruo Yoda, Kodaira, and Masayoshi Kameyama, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 6, 1976, Ser. No. 674,094
Claims priority, application Japan, Apr. 9, 1975, 50-42374
Int. Cl.² G06F 3/05; G06K 9/04
U.S. Cl. 364—200 **10 Claims**

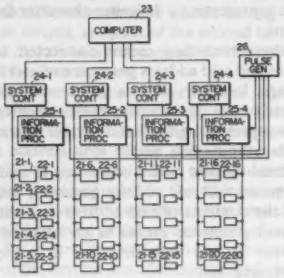
1. A group control system, coupled to a computer which processes information supplied thereto from said system, comprising:

first means for generating plural groups of sequential pulses each of said pulse groups being shifted in time with respect to each other;

plural groups of image pickup devices, coupled to said first means, the image pickup devices in each respective group being responsive to a respective group of sequential pulses generated by said first means, with each image pickup device of a respective group of image pickup devices converting a received image pattern into electrical image signals representative of the received image pattern under

the synchronizing control of the pulses in that respective pulse group to which said respective group of image pickup devices is responsive;

a plurality of visual information processors, coupled to said first means and the respective groups of image pickup devices, each visual information processor being responsive to a respective group of sequential pulses generated by said first means and extracting predetermined feature information of the image patterns represented by the



electrical image signals generated by the image pickup devices of that respective group of image pickup devices to which said each visual information processor is coupled, under the synchronizing control of the pulses in that respective pulse group to which said that respective group of image pickup devices is responsive; and

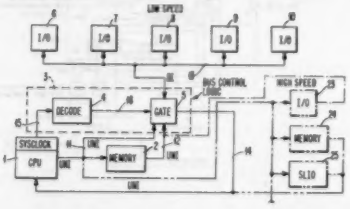
second means, coupled to said visual information processor and said computer, for supplying feature information extracted by said visual information processors to said computer.

4,057,846

BUS STEERING STRUCTURE FOR LOW COST PIPELINED PROCESSOR SYSTEM

William Clyde Cockerill; Louis Michael Hornung; Donavon William Johnson, and Richard Alan Vrba, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 7, 1976, Ser. No. 693,821
Int. Cl.² G06F *3/00*
U.S. Cl. 364—200 **7 Claims**



1. In a word processing system including a CPU, a memory, and a plurality of I/O devices which operate at speeds slower than said CPU and said memory, apparatus for controlling the flow of information among said CPU, said memory, and said I/O devices comprising:

a first unidirectional buss connected to the output of the CPU for transmitting information signals from the CPU;

a second unidirectional buss connected to the output of said memory for transmitting information signals from said memory;

a third unidirectional buss connected to the input of said CPU for transmitting information signals to said CPU;

a bidirectional buss connected to said I/O devices for transmitting information to and from said I/O devices;

decoding means connected to said CPU for decoding control signals from the CPU; and

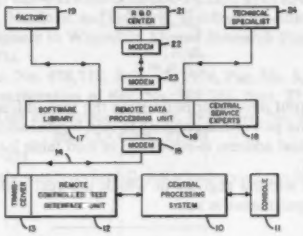
gating means responsive to said decoding means and connected to said first unidirectional buss, said second unidirectional buss, said third unidirectional buss, and said bidirectional buss for receiving information from said first and second unidirectional busses and said bidirectional buss and transferring the received information onto said third unidirectional buss or said bidirectional buss.

4,057,847

REMOTE CONTROLLED TEST INTERFACE UNIT

William P. Lowell, Shoreview, and Douglas M. Jagunich, New Brighton, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 695,874
Int. Cl.² G06F *3/00, 11/04*
U.S. Cl. 364—200 **14 Claims**



1. A universal remotely controlled test interface unit for operating central processing units and peripheral devices of a data processing system from a remote location comprising:

a communications transceiver for receiving from a remote data processing unit information containing control signals and data signals,

input data control means for receiving and processing said information from said communications transceiver,

buffer storage means connected to said input data control means for receiving and storing said data signals,

format control means connected to said input data control means for receiving and processing said control signals,

control register means for receiving and storing the data contents of said buffer storage means,

logic gating means connecting said buffer storage means to said control register means for transferring the contents of said buffer storage means to said control register means under the control of said format control means,

said control register means being partitioned into a plurality of groups of storage cells by said control signals to define a parallel line interface compatible with the processing unit to be operated from said remote location by said data signals, and

said control register means further comprising groups of control storage cells and groups of data storage cells adapted to test the unit to be operated from a remote data processing unit.

4,057,848

ADDRESS TRANSLATION SYSTEM

Kenji Hayashi, Hadano, Japan, assignor to Hitachi, Ltd., Japan

Filed June 9, 1975, Ser. No. 584,829
Claims priority, application Japan, June 13, 1974, 49-67355
Int. Cl.² G06F *7/04*
U.S. Cl. 364—200 **7 Claims**

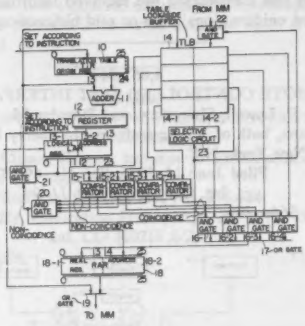
1. An address translation system for mapping a plurality of logical spaces onto a real space, comprising

a logical address register in which a logical address is set;

a table lookaside buffer for storing translation pairs each including said logical address and a corresponding real

address to translate said logical address set in said logical address register into said real address whose bit number is larger than that of said logical address;

a searching means for judging whether said table lookaside buffer contains the same logical address as that set in said logical address register or not;



an output means for outputting the real address of the translation pair corresponding to said logical address when said logical address is contained in said table lookaside buffer; and

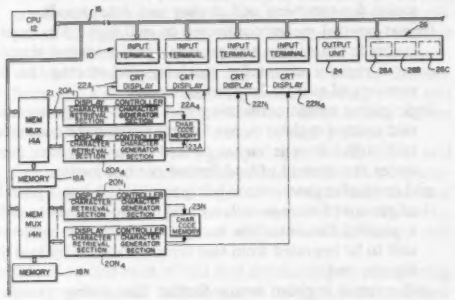
a real address register in which the real address from said output means is set.

4,057,849

TEXT EDITING AND DISPLAY SYSTEM

Charles W. Ying, Andover, and Richard Ying, Brookline, both of Mass., assignors to Atex, Incorporated, Bedford, Mass.

Continuation of Ser. No. 508,359, Sept. 23, 1974, abandoned.
This application Aug. 23, 1976, Ser. No. 717,000
Int. Cl.[2] G11B *27/02*
U.S. Cl. 364—200 **24 Claims**



1. A unit for displaying characters including predetermined delimiter characters on a plurality of lines, said unit comprising:

A. memory means for storing character codes in a plurality of addressable storage locations, the character codes representing the characters to be displayed, each character code designating whether it represents a delimiter character;

B. display means for displaying characters at a predetermined number of consecutive display positions along a given line in a predetermined timing sequence in response to the character codes;

C. timing means connected to said display means for establishing the predetermined timing sequence;

D. transfer means connected to said memory means, said display means and said timing means for transferring the character codes from said memory means to said display means;

E. address generator means connected to said timing means and said memory means for applying addresses to said memory means thereby to cause a retrieval of character codes from said memory means in a sequence corresponding to the consecutive display positions

F. delimiter means connected to said transfer means and responsive to the retrieval of character codes from said memory means for indicating the transfer of a character code representing a delimiter character from said memory means,

G. address recording means connected to said delimiter means and said address generator means for recording the storage location address from said address generator means when said transfer means receives the character code representing the last delimiter character that is to be displayed on a line, and

H. address transfer means connected to said address recording means and said address generator means for transferring the contents of said address recording means to said address generator means as an updated character code address for the first character in a succeeding line of characters; and

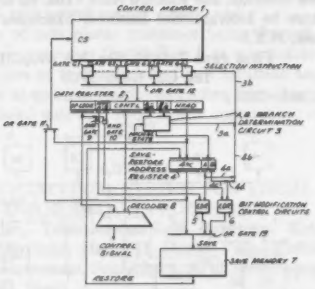
I. control means connected to said transfer means and said delimiter means for inhibiting the transfer from said transfer means to said display means of character codes succeeding the character code representing the last delimiter character for the given line.

4,057,850

PROCESSING LINK CONTROL DEVICE FOR A DATA PROCESSING SYSTEM PROCESSING DATA BY EXECUTING A MAIN ROUTINE AND A SUB-ROUTINE

Saburo Kaneda, Yokohama, and Koichi Tokura, Ichikawa, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 24, 1975, Ser. No. 634,401
Claims priority, application Japan, Nov. 26, 1974, 49-137361
Int. Cl.[2] G06F *9/12, 9/20*
U.S. Cl. 364—200 **3 Claims**



1. A processing link control device in a data processing system for modifying a conditional branch instruction address for a return address from a sub-routine to a main routine, said processing link control device comprising

a control memory having an address input and a plurality of outputs;

a plurality of AND gates each having a first input, a second input and an output, the first inputs of the AND gates being connected to the outputs of the control memory;

a data register having an input coupled to the outputs of the AND gates, said data register storing an instruction code field, modification bits field, a control bit field, condition branching fields and the next address in corresponding areas thereof;

a branch determination circuit determining an instruction for

selecting in accordance with a machine state, a single micro-instruction of four which are read out from the control memory, said branch determination circuit being connected to the second input of each of the AND gates for controlling said gates, said branch determination circuit having inputs connected to the condition branching field areas of the data register, and an output;

a first bit modification control circuit having a pair of inputs and an output, an input of the first bit modification control circuit being connected to the modification bits field of the data register;

a second bit modification control circuit having a pair of inputs and an output, an input of the second bit modification control circuit being connected to the modification bits field of the data register;

a save-restore address register storing the address and branch address bits in corresponding areas thereof, said save-restore address register having input means coupled to the next address area of the data register and input means coupled to the output of the branch determination circuit, output means coupled to the address input of the control memory, output means from a first branch address bit area thereof coupled to the second input of each of the AND gates for controlling said gates and connected to the other input of the first bit modification control circuit, and output means from a second branch address bit area thereof coupled to the second input of each of the AND gates for controlling said gates and connected to the other input of the second bit modification control circuit; and

a save memory for storing the return address, said save memory having input means coupled to the address area of the save-restore address register and to the outputs of the first and second bit modification control circuits, and output means coupled to the address area of the save-restore address register, said address area including the branch address bits, whereby any of a plurality of return addresses is designated by selection of the modification bits in the branch and link instruction and access is provided simultaneously for four word address positions of the control memory by the next address, four micro-instructions are read out from the control memory by the next address and only one of the four micro-instructions is selected by the condition branching fields via the AND gates and set in the data register.

4,057,851

CHIRAL

2-SUBSTITUTED-4-HYDROXY-2-CYCLOPENTEN-1-ONE

Charles J. Sih, Madison, and James B. Heather, Middleton, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 478,713, June 13, 1974, Pat. No. 3,968,141, which is a continuation of Ser. No. 309,766, Nov. 27, 1972, abandoned. This application May 20, 1976, Ser. No. 688,276

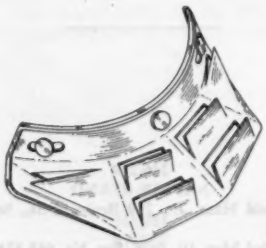
Int. Cl.[2] C07C *61/38*

U.S. Cl. 560—121 **1 Claim**

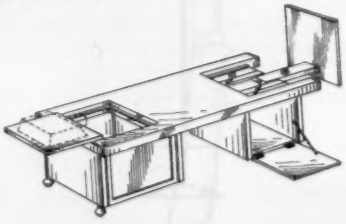
1. 2-(6'-carbomethoxyhexyl)-4(R)-hydroxy-2-cyclopenten-1-one.

246,271
DIVING HELMET
Leon A. Cerniway, and Bruce C. Marx, both of Orange County, Calif., assignors to U.S. Divers Co., Santa Ana, Calif.
Filed Jan. 9, 1976, Ser. No. 647,929
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

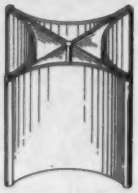
246,272
SUN VISOR
William P. Bay, Rte. 1, Box 53, Ormond Beach, Fla. 32074
Filed June 18, 1976, Ser. No. 697,339
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—233



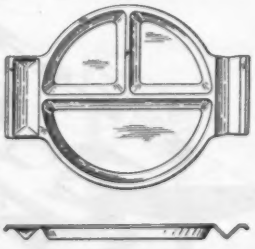
246,273
COMBINED STORAGE CABINET PROJECTOR SUPPORT AND MOVIE SCREEN UNIT
George Kavis, 355 E. 146th St., Harvey, Ill. 60426
Filed June 27, 1975, Ser. No. 591,145
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—161



246,274
COMBINED STORAGE AND DISPLAY DEVICE FOR GRAPHIC PICTURES OR THE LIKE
Carl Nelson, and Bruce Grossman, both of 1900 W. Estes, Chicago, Ill. 60626
Filed Dec. 1, 1975, Ser. No. 636,692
Term of patent 14 years
Int. Cl. D6—*07*; D20—*02*
U.S. Cl. D6—234

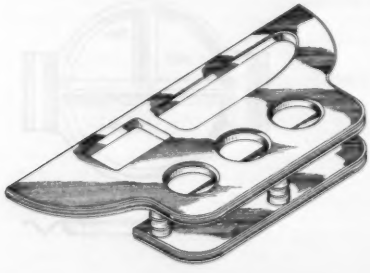


246,275
COMPARTMENTED PLATE
Robert L. Wiley, Lake Forest, Ill., assignor to SiLITE, Incorporated, Chicago, Ill.
Filed Apr. 26, 1976, Ser. No. 680,292
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—21

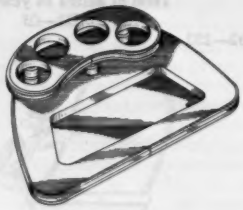


246,276
DINNER PLATE
Otto J. Lund, Wrightwood, Calif., assignor to H. F. Coors Company, Inc., Inglewood, Calif.
Filed Jan. 2, 1976, Ser. No. 646,040
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—35

246,277
SNACK TRAY
Frank Forselius, 12924 S. Main St., Los Angeles, Calif. 90061
Filed Feb. 23, 1976, Ser. No. 660,669
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38

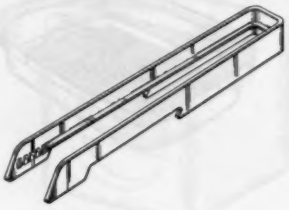


246,278
SNACK TRAY
Frank Forselius, 12924 S. Main St., Los Angeles, Calif. 90061
Filed June 16, 1976, Ser. No. 696,778
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



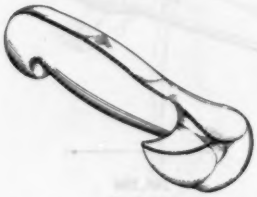
246,279
NAPKIN STAND
Frederick Arnold Haas, Jr., 279 Brainerd St., South Hadley, Mass. 01075
Filed Mar. 10, 1976, Ser. No. 665,371
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—72

246,280
TONGS
Robert H. C. M. Daenen, Aalst, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Feb. 5, 1976, Ser. No. 655,324
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—105



246,281
KNIFE
Daniel A. Ferrara, Jr., New Milford, Conn., assignor to Ferrara-Benedek Design, Inc., New York, N.Y.
Filed Apr. 21, 1976, Ser. No. 679,119
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—150

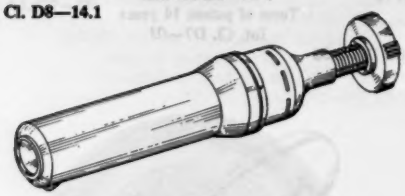
246,282
KNIFE HANDLE
Dennis B. Jackson, Nunawading, Australia, assignor to Wiltshire Cutlery Company Proprietary Ltd., Australia
Filed May 13, 1975, Ser. No. 577,058
Claims priority, application Australia, Nov. 14, 1974, 66057/74
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—152



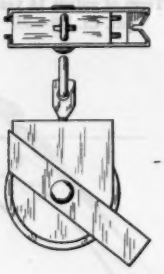
246,283
SKI BOOT BUCKLING TOOL
Alan D. Sapowith, 438 Old Connecticut Path, Apt. 2, Framingham, Mass. 01710
Filed Jan. 23, 1976, Ser. No. 651,969
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

246,284
DEVICE FOR REMOVING SHEETS FROM A FILE OF PAPERS
Edelmiro Salas Arce, E 18 Temple St., Santa Ana, Rio Piedras, P.R. 00927
Filed May 28, 1976, Ser. No. 690,870
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

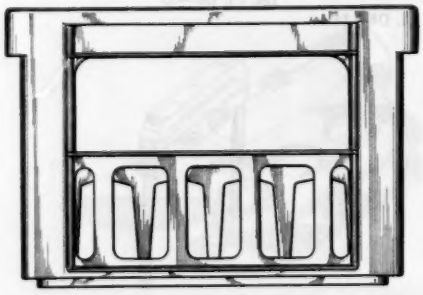
246,285
HAND DRIVEN CAULKING GUN
Fred James Gallagher, 200 Maitland Ave., Apartment 6, Altamonte Springs, Fla. 32701
Filed Feb. 20, 1976, Ser. No. 659,663
Term of patent 3½ years
Int. Cl. D8—*05*
U.S. Cl. D8—14.1



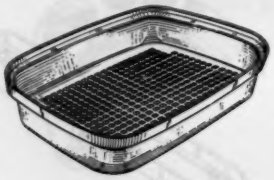
246,286
PULLEY
Junius Thomas Moore, Charleston, W. Va., assignor to The Moore Company, Inc., Charleston, W. Va.
Filed Feb. 13, 1976, Ser. No. 658,045
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D8—360



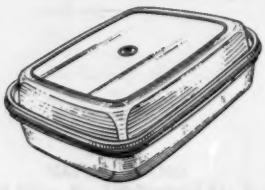
246,287
BOTTLE CRATE
Erwin Tietz, Varmlandsgatan 22, Alingsas, Sweden
Filed Feb. 21, 1975, Ser. No. 551,708
Claims priority, application Sweden, Aug. 22, 1974, 1334/74
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177



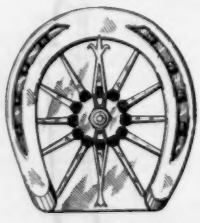
246,288
FOOD CONTAINER
Richard A. Boucher, Northboro, Mass., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 9, 1976, Ser. No. 647,951
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



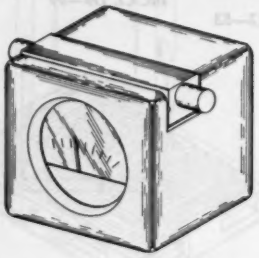
246,289
FOOD CONTAINER
Richard A. Boucher, Northboro, Mass., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 9, 1976, Ser. No. 647,833
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—240



246,290
CLOCK
Charles R. Shelton, 36505 Florida Ave., No. 205, Hemet West, Calif. 92343
Filed June 16, 1976, Ser. No. 696,568
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—6



246,291
WATTMETER OR SIMILAR HOUSING
Rudolph William Krolopp, Palatine, Villa Park, Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 8, 1976, Ser. No. 665,026
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—75

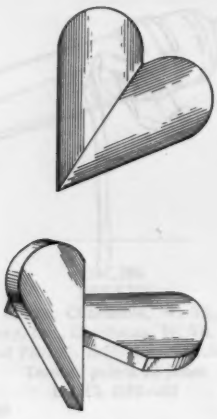


246,292
YARN FAULT DETECTOR
Kenneth Albert Jordan, Oadby, England, assignor to Trip-Lite Ltd., England
Filed Aug. 15, 1975, Ser. No. 605,366
Claims priority, application United Kingdom, Feb. 25, 1975, 970006/75
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46

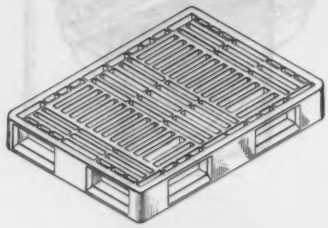
246,293
ADJUSTABLE BRACELET OR SIMILAR ARTICLE
Michael V. Doughty, 21075 Marie, Warren, Mich. 48089
Filed July 7, 1975, Ser. No. 593,753
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

246,294
ARTIFICIAL LEAF
Susan Kaye Hetherington, 4018 Northridge, Norman, Okla. 73069
Filed Oct. 7, 1976, Ser. No. 730,457
Term of patent 14 years
Int. Cl. D11—*04*
U.S. Cl. D11—117

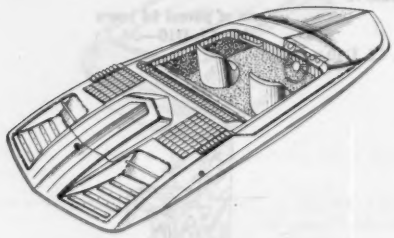
246,295
CONVERTIBLE PLAQUE
Richard C. Lewis, 464 Green Bay Road, Winnetka, Ill. 60093
Filed Mar. 15, 1976, Ser. No. 666,928
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—133



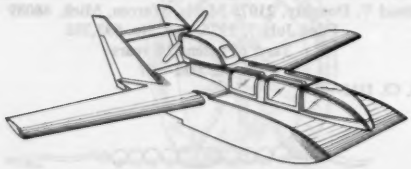
246,296
PALLET
Mituru Fujii, Urawa, and Izumi Narusawa, Tokyo, both of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan
Filed Apr. 27, 1971, Ser. No. 138,011
Claims priority, application Japan, Oct. 30, 1970, 50-37355
The portion of the term of this patent subsequent to Nov. 18, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—53



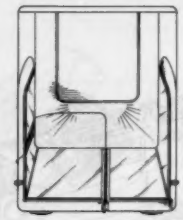
246,297
BOATS
Warwick M. Whitley, Austin, Tex., and Arthur E. Carlson, Garden Grove, Calif., assignors to Conroy, Inc., San Antonio, Tex.
Filed Apr. 20, 1976, Ser. No. 678,644
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62

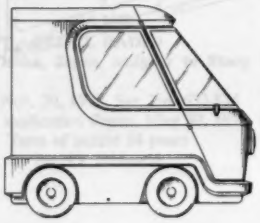


246,298
AMPHIBIOUS AIRPLANE
Carl I. Hansen, Box 106, Melvin Village, N.H. 03850
Filed Sept. 3, 1976, Ser. No. 720,264
Term of patent 7 years
Int. Cl. D12—*14*
U.S. Cl. D12—75

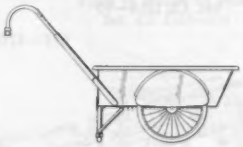


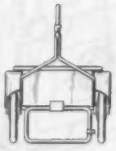
246,299
ELECTRIC CAR
Robert E. Haggard, 602 Warren St., Everett, Wash. 98201
Filed Oct. 4, 1976, Ser. No. 729,413
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—90





246,300
TRAILER
Charles W. Dortch, Houston, and Donald K. Vaught, Victoria, both of Tex., assignors to George C. Ballas, Sr., Houston, Tex.
Filed June 18, 1976, Ser. No. 697,676
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—105

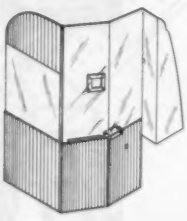




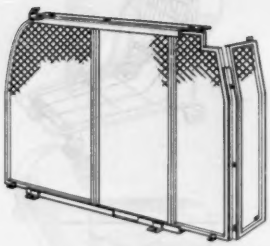
246,301
NESTABLE STROLLER
Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Carl-All Inc., Montreal East, Canada
Filed May 6, 1976, Ser. No. 683,916
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129

246,302
FOLDING WALKER
Morton I. Thomas, 101 Gedney St., Nyack, N.Y. 10960
Filed Sept. 15, 1975, Ser. No. 613,699
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—130

246,303
PROTECTIVE PARTITION FOR PUBLIC TRANSPORTATION VEHICLES
Dan Lee Davis, 21400 W. 7 Mile, Apt. 214, Detroit, Mich. 48219
Filed Mar. 5, 1976, Ser. No. 664,144
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—195

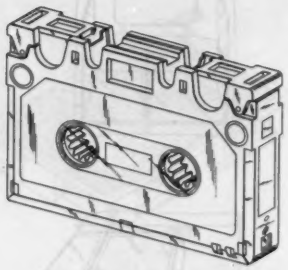


246,304
VEHICLE INTERIOR PARTITION
James Horn, 6421 Dorcas St., Philadelphia, Pa. 19111
Filed Sept. 13, 1976, Ser. No. 722,618
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—195

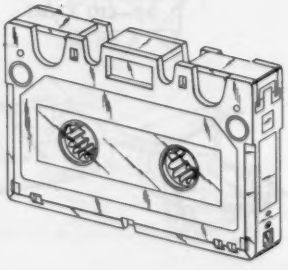


246,305
CASSETTE RECORDER HOUSING
William Gergely, Jr., 108 Twinbrook Terrace, Monroe, Conn. 06468, and Okun Kwan, 41 Inca Drive, Trumbull, Conn. 06011
Filed June 28, 1976, Ser. No. 700,590
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6

246,306
TAPE CASSETTE
Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed June 25, 1976, Ser. No. 699,796
Claims priority, application Japan, Dec. 27, 1975, 50-51653
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—11

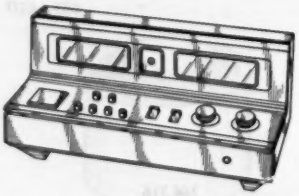


246,307
TAPE CASSETTE
Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed June 25, 1976, Ser. No. 699,798
Claims priority, application Japan, Dec. 27, 1975, 50-51654
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—11

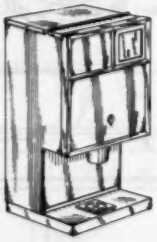


246,308
ILLUMINATED TELEPHONE DIAL
John R. Scantlin, 685 MacCulloch Drive, Los Angeles, Calif. 90049
Filed June 1, 1976, Ser. No. 691,238
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

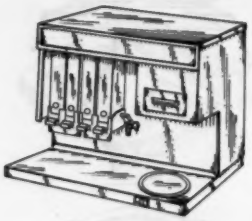
246,309
CLOCK RADIO
Aya Nakamura, Osaka, Japan, assignor to Sharp Kabushiki Kaisha
Filed Nov. 20, 1975, Ser. No. 633,824
Claims priority, application Japan, May 30, 1975, 50-22008
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73



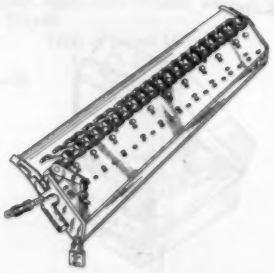
246,310
COFFEE DISPENSER
Martelle Jerome Syverson, deceased, late of Albert Lea, Minn., by David B. Syverson and Jon R. Syverson, executors, both of Albert Lea, Minn., assignors to Fountain Industries, Inc., Albert Lea, Minn.
Filed July 16, 1975, Ser. No. 596,216
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—113



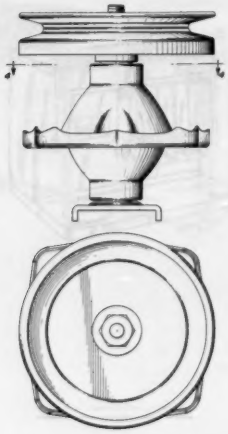
246,311
BEVERAGE DISPENSER
Martelle Jerome Syverson, deceased, late of Albert Lea, Minn., by David B. Syverson and Jon R. Syverson, executors, both of Albert Lea, Minn., assignors to Fountain Industries, Inc., Albert Lea, Minn.
Filed July 16, 1975, Ser. No. 596,215
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—116



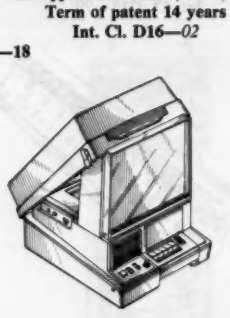
246,312
APPARATUS FOR FORMING PAPER ON A CYLINDER MOLD
John Herbert Gordon, Bradford, and Frank A. Duchnowski, Lawrence, both of Mass., assignors to J. H. Horne & Sons Company, Inc., Lawrence, Mass.
Filed Jan. 30, 1975, Ser. No. 545,340
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—135



246,313
PULLEY, SHAFT AND BLADE-HOLDER ASSEMBLY FOR A POWER-DRIVEN LAWNMOWER OR THE LIKE
John C. Gunn, and James E. Null, both of Newark, Ohio, assignors to Buckeye Industrial Sales, Inc., Newark, Ohio
Filed Apr. 29, 1976, Ser. No. 681,752
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—148

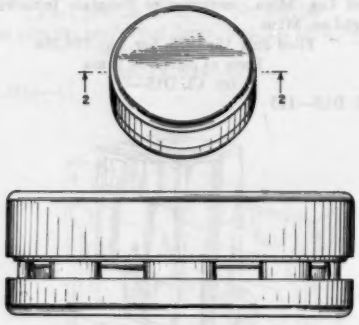


246,314
FILMSTRIP PROJECTOR
Norman R. Kubnick, Skokie, and Dennis J. Erber, Palatine, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Continuation-in-part of Ser. No. 539,878, Jan. 9, 1975, abandoned. This application Jan. 7, 1976, Ser. No. 647,256
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—18

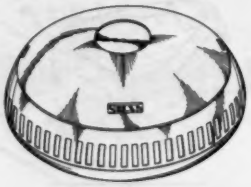


246,315
COMBINED SINK AND LIGHT BOX
Leo K. Tongish, 10206 San Juan Ave., South Gate, Calif. 90280
Filed Feb. 22, 1977, Ser. No. 770,458
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58

246,316
DISPENSER FOR AIR TREATING MATERIAL
Frederick B. Hadtke, New Providence, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Feb. 24, 1976, Ser. No. 660,941
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

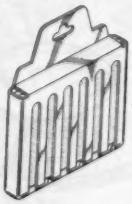


246,317
DISPENSER FOR AIR-TREATING MATERIAL
Eric Desmond Heath, Prestbury; Stewart Charles Arthur Young, Macclesfield; Michael James Wade, Wilmslow, and Brian Smith, Clifton, all of England, assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed July 22, 1976, Ser. No. 707,593
Claims priority, application United Kingdom, Jan. 27, 1976, 974123/76
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

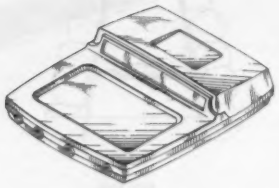


246,318
DISPENSER FOR AIR TREATING MATERIAL
Albert F. Layton, Hillsdale, and Frederick B. Hadtke, New Providence, both of N.J., assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed Dec. 27, 1976, Ser. No. 755,114
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

246,319
DISPENSER FOR AIR TREATING MATERIAL
Bernard Rabussier, Aventon; Jean-Pierre Mandon, Poitiers; Philippe Lecomte, Plaisance Vouille, and Louis Nuer, Poitiers, all of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed Jan. 21, 1977, Ser. No. 761,511
Claims priority, application Switzerland, July 22, 1976, 108755/76
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



246,320
DENTAL CONSOLE
Danny Michael Truette, Pineville, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.
Filed Nov. 12, 1976, Ser. No. 741,517
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—5



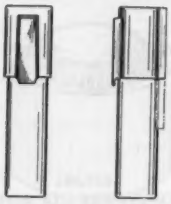
246,321
DISPOSABLE SYRINGE FOR STORING AND ADMINISTERING PHARMACEUTICAL PREPARATIONS
Claes Peter Löfman, Stockholm, Sweden, assignor to Astra Lakemedel Aktiebolag, Sodertalje, Sweden
Filed Nov. 20, 1975, Ser. No. 633,604
Claims priority, application Sweden, June 5, 1975, 751159; June 5, 1975, 751160
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—24

246,322
MAXILLARY ORTHOPEDIC SUTURE SEPARATING ORTHODONTIC APPLIANCE
James S. Krygier, Suite 103, Plaza Apt. Bldg., Wilmington, Del. 19806
Filed Nov. 12, 1976, Ser. No. 741,284
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—34

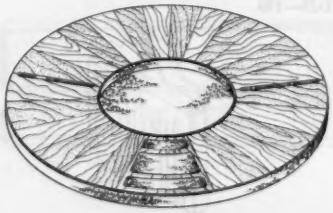
246,323
DECORATIVE END PIECE FOR USE ON UPRIGHT ENDS OF FREE-STANDING OFFICE DIVIDERS
John Kirk, 59 Olsen Drive, Don Mills, Ontario, Canada
Filed Oct. 30, 1975, Ser. No. 627,497
Claims priority, application Canada, Oct. 3, 1975, 0310752
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75

246,324
PROTECTIVE CAP FOR A SHAVING HEAD
Klaas Tiemen Oord, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 12, 1976, Ser. No. 648,312
Claims priority, application Netherlands, July 17, 1975, 7550441
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—50

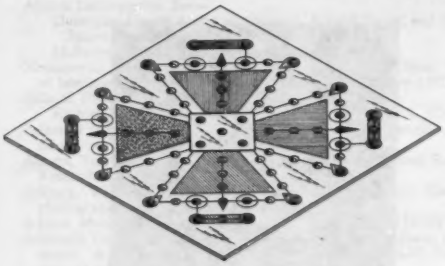
246,325
FIRE EXTINGUISHER
William J. Rakocy, Clifton, N.J., and Howard L. Rauch, Brooklyn, N.Y., assignors to North American Philips Corporation, New York, N.Y.
Filed June 11, 1975, Ser. No. 586,053
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D29—2



246,326
BACKGAMMON GAMEBOARD
James R. Watson, 6631 Orchid, Dallas, Tex. 75230
Filed Feb. 2, 1976, Ser. No. 654,289
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



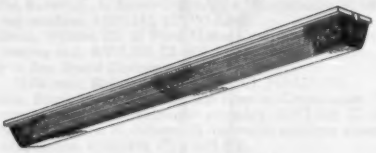
246,327
GAME BOARD
Dan L. Luther, 1819 Smythe St., No. 86, San Ysidro, Calif. 92173
Filed Apr. 15, 1976, Ser. No. 677,499
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PB



246,328
GOLF CLUB HEAD
George E. Tanner, 15315 Wilmer Ave., Paramount, Calif. 90723
Filed June 23, 1976, Ser. No. 699,177
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

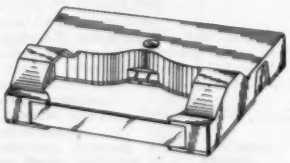
246,329
GOLF PUTTER HEAD
Harry H. Little, 202 Cedar Lane, Apt. 11, Vienna, Va. 22180
Filed June 24, 1976, Ser. No. 699,574
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

246,330
FLUORESCENT LIGHT FIXTURE
Kenneth P. Krase, Chicago, and Kenneth R. Hawkins, Gurnee, both of Ill., assignors to Kenall Manufacturing Company, Chicago, Ill.
Filed May 27, 1976, Ser. No. 690,505
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 A



246,331
GUITAR HEAD
Grover G. Fields, Stanton, Calif., assignor to CBS Inc., New York, N.Y.
Filed Nov. 18, 1974, Ser. No. 524,786
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

246,332
INK RIBBON CARTRIDGE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed Jan. 5, 1976, Ser. No. 646,710
Claims priority, application Italy, July 10, 1975, 53214/75
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 A

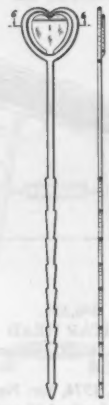


246,333

CARD HOLDER OR THE LIKE

Walter Boecher, Jr., P.O. Box 3455, Lantana, Fla. 33462

Filed Mar. 19, 1976, Ser. No. 668,703
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D96—12 A

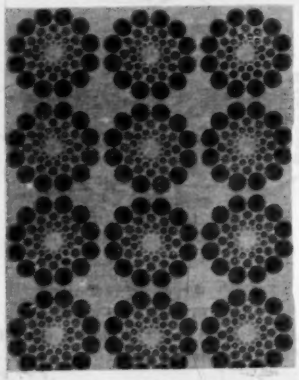


246,334

UPHOLSTERY FABRIC OR THE LIKE

Verner Panton, Binningen, Switzerland, assignor to Mira-X S.A. Suhr, Switzerland

Filed Mar. 26, 1975, Ser. No. 562,371
Claims priority, application Switzerland, Dec. 27, 1974, 60138/74
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—1 T



246,335

MILK REQUIREMENT INDICATOR

John Leslie Hopkins, 8 Carrwood Road, Bramhall, Stockport, Cheshire, and Arthur Holmes, Rombald 25 Ryburn Avenue, Blackburn, Lancashire, both of England

Filed Dec. 31, 1975, Ser. No. 645,620
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D96—2

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF NOVEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Svenska Flaktfabriken: *See*—
Jansson, Staffan, 4,057,406, Cl. 55-385.00R.

Abbott Laboratories: *See*—
Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, 4,057,582, Cl. 260-574.000.
McIntire, Floyd Cottam, 4,057,685, Cl. 536-18.000.

Abramovici, Jean; Ermans, Andre Marie; and Jeghers, Omer. Method of labeling proteins with technetium. 4,057,617, Cl. 424-1.000.

Adachi, Fumiyuki: *See*—
Hattori, Takeshi; and Adachi, Fumiyuki, 4,057,758, Cl. 325-56.000.

Adams, Frederick John, to Cam Gears Limited. Plural-service hydraulic system. 4,057,073, Cl. 137-118.000.

Adams, Truman W., to Indianapolis Center For Advanced Research. Releasable anchor. 4,057,024, Cl. 114-298.000.

Adcock, Willis A., to Texas Instruments Incorporated. Electronic photography system. 4,057,830, Cl. 358-127.000.

Addoo, Marie. Telephone dial lock. 4,057,697, Cl. 179-189.00D.

Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, to G. D. Searle & Co. Triarylpropyl-azabicyclooctanes. 4,057,549, Cl. 260-293.540.

Adrian, Werner Karl; and Borkenstein, Robert Frank. Determination of the alcohol content of blood. 4,057,724, Cl. 250-343.000.

AeroVironment Inc.: *See*—
MacCready, Paul B., Jr.; and Lissaman, Peter B. S., 4,057,280, Cl. 296-1.00S.

AGFA-Gevaert Aktiengesellschaft: *See*—
Wick, Richard; Pfeifer, Josef; and Schnall, Gunther, 4,057,344, Cl. 355-16.000.

AGFA-GEVAERT, N. V.: *See*—
De brabandere, Luc Achiel; Pollet, Robert Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, 4,057,429, Cl. 96-94.00R.

Ahrens, Hanns: *See*—
Biere, Helmut; Ahrens, Hanns; Rufer, Clemens; Schroder, Eberhard; and Koch, Henning, 4,057,640, Cl. 424-274.000.

Aibara, Shunzo: *See*—
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,057,629, Cl. 424-177.000.

Airco, Inc.: *See*—
Brace, Arthur A.; and Lesnewich, Alexander, 4,057,420, Cl. 75-53.000.

Airscrew Howden Limited: *See*—
Letts, Robert Arthur, 4,056,882, Cl. 29-597.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Mori, Masanori, 4,057,135, Cl. 192-111.00A.
Nakashima, Katsushi, 4,057,700, Cl. 200-84.00C.
Yamazaki, Shinichiro; and Hanabashi, Teruyuki, 4,057,166, Cl. 220-8.000.

Akasaka, Shigeo; and Tanaka, Hiroaki, to Nippon Kogaku K.K. Exposure time control device in a cinecamera. 4,057,333, Cl. 352-141.000.

Akimoto, Hiroshi: *See*—
Sugimoto, Keiichi; Nishijima, Koji; Akimoto, Hiroshi; Hanaoka, Tadashi; and Kakeya, Nobuharu, 4,057,544, Cl. 260-239.100.

Akiyama, Fumitake: *See*—
Arikawa, Hiroo; Akiyama, Fumitake; and Maruo, Masaya, 4,057,774, Cl. 337-164.000.

Akzo N.V.: *See*—
de Rook, Poppe, 4,057,526, Cl. 260-29.60S.

Akzona Incorporated: *See*—
Craig, Jeffrey M., 4,057,350, Cl. 356-199.000.
Zengel, Hans-Georg; and Bergfeld, Manfred, 4,057,588, Cl. 260-621.00R.

Albert, Richard D. Scanning X-ray source. 4,057,745, Cl. 313-55.000.

Albrecht, Robert J.; and Fraunberger, Martin J., to Nabisco, Inc. Vacuum slide valve. 4,057,078, Cl. 137-625.200.

Alcan Research and Development Limited: *See*—
Gilliand, Andre Ferdinand Louis; and Looser, Christian, 4,056,921, Cl. 53-167.000.

Alder, Hanspeter, to Swiss Aluminium Ltd. Inconsumable electrodes. 4,057,480, Cl. 204-290.00R.

Alexander Binzel Corporation: *See*—
Geus, Ewald; and Tammi, Vesa, 4,057,704, Cl. 219-75.000.

Allen, Richard E., to Corning Glass Works. Electric heating unit. 4,057,707, Cl. 219-543.000.

Allied Chemical Corporation: *See*—
Barrett, Joseph J., 4,057,349, Cl. 356-45.000.
Kurtz, Bruce E.; Guptill, Joel P.; and Fitch, Robert H., 4,057,474, Cl. 204-98.000.
Lee, Lester T. C.; Dege, Gerald J.; and Liu, Kang-Jen, 4,057,481, Cl. 204-296.000.
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,056,973, Cl. 73-91.000.

Allis, Robert F., to Xerox Corporation. Illumination slit for a reproducing machine. 4,057,342, Cl. 355-8.000.

Allison, William D., to Ford Motor Company. Frangible tie rod end bearing seat. 4,057,355, Cl. 403-2.000.

Alton Box Board Company: *See*—
Wilkinson, Robert M., 4,057,201, Cl. 242-125.100.

Altoz, Frank E., to Westinghouse Electric Corporation. Temperature controlled airborne electronic assembly. 4,057,104, Cl. 165-35.000.

Alvarez-Calderon F., Alberto M. Inflatable envelope systems for use in excavations. 4,056,939, Cl. 61-35.000.

Alza Corporation: *See*—
Higuchi, Takeru; and Hussain, Anwar, 4,057,619, Cl. 424-14.000.

Amano, Kitsutaro: *See*—
Kinuhata, Koji; Amano, Kitsutaro; Sasaki, Hiroshi; and Yamamoto, Hideo, 4,057,835, Cl. 358-140.000.

American Can Company: *See*—
Wiggins, Glenn C.; Kreh, Marvin J.; and Davis, Robert S., 4,057,667, Cl. 428-35.000.

American Cyanamid Company: *See*—
Blank, Werner Josef, 4,057,523, Cl. 260-29.4UA.
Grudzinskas, Charles Vincent; and Weiss, Martin Joseph, 4,057,571, Cl. 560-121.000.

American Electromedics Corporation: *See*—
Kerouac, Adrian R., 4,057,051, Cl. 128-2.00Z.

American Home Products Corporation: *See*—
Asselin, Andre A.; Humber, Leslie G.; and Dobson, Thomas A., 4,057,559, Cl. 260-315.000.
Sellstedt, John H.; and Klaubert, Dieter H., 4,057,632, Cl. 424-248.540.

American Hospital Supply Corporation: *See*—
Resch, Alvin Charles, Jr., 4,057,306, Cl. 312-218.000.

American Medical Products Company: *See*—
Gossett, Rodger L., 4,057,047, Cl. 126-263.000.

American Microsystems, Inc.: *See*—
Smedley, Sean Anthony, 4,057,844, Cl. 361-111.000.

American National Red Cross: *See*—
Schwartz, Robert T.; and Harrison, Marc S., 4,057,288, Cl. 297-239.000.

Amos, James W., to Canton Textile Mills, Inc. Apparatus and method for winding yarn on a bobbin. 4,057,196, Cl. 242-18.0PW.

AMP Incorporated: *See*—
Evans, William Robert, 4,057,311, Cl. 339-17.00M.

Anamorphic Ltd.: *See*—
Ehrenhaft, Franz F.; and Rosin, Seymour, 4,057,345, Cl. 355-35.000.

Anderson-Cook, Inc.: *See*—
Anderson, Marvin R.; and Jungesjo, Harald N., 4,056,901, Cl. 51-165.870.

Anderson, Marvin R.; and Jungesjo, Harald N., to Anderson-Cook, Inc. Dresser and grinding machine therefor. 4,056,901, Cl. 51-165.870.

Anderson, Paul J. Hand-held ice auger. 4,057,114, Cl. 173-26.000.

Ando, Susumu: *See*—
Kinoshita, Mototaka; Okabe, Akio; and Ando, Susumu, 4,057,495, Cl. 210-44.000.

Andrews, Frank; and McKee, Richard W., to Federal Signal Corporation. Slide cam assembly for railroad-crossing gate mechanism. 4,057,208, Cl. 246-125.000.

Angleraud, Rene; and Ledru, Pierre, to Rhone-Poulenc Industries. Process for the manufacture of heat resistant multicellular materials. 4,057,518, Cl. 260-2.50N.

Angner, Ronald Joseph; Blount, Marion Lee; and Lacy, James Volney, to Bell Telephone Laboratories, Incorporated. Logic control for electronic key telephone line circuit. 4,057,693, Cl. 179-99.000.

Antonini, Albert; Joffre, Philippe; and Laine, Francois, to Rhone-Poulenc Industries. Oxychlorination of ethylene with fluid bed catalyst. 4,057,592, Cl. 260-659.00A.

Aono, Shigeo, to Nissan Motor Co., Ltd. Air-fuel mixture control apparatus for internal combustion engines using digitally controlled valves. 4,057,042, Cl. 123-119.0EC.

Apollo Chemical Corporation: *See*—
Bennett, Robert P.; and Kukin, Ira, 4,057,398, Cl. 44-4.000.

Appleton, Richard Anthony; and Brown, Kevin, to Fisons Limited. Method of treating inflammation with 2-(2,3-dihydro-2-isopropyl-4-oxo-4H-1-benzopyran-6-yl)propionic acid. 4,057,641, Cl. 424-283.000.

Arachnid, Incorporated: *See*—
Jones, Richard F.; and Ping, Ernest L., 4,057,251, Cl. 273-95.00R.

Aramaki, Minoru: *See*—
Ono, Tetsuhiro; Aramaki, Minoru; Mizuno, Tamotsu; and Fujinaga, Masao, 4,057,614, Cl. 423-490.000.

Arbel Industrie: *See*—
Laurent, Jacky Adrien Paul; and Croix-Marie, Francis Jean-Marie, 4,057,018, Cl. 104-48.000.

Arca Holding S.A.: *See*—
Elfstrom, Carry Allon, 4,056,906, Cl. 52-233.000.

Arguello, Leonard E., to W. R. Grace & Co. Constant duty cycle monostable. 4,057,740, Cl. 307-273.000.

Argus Chemical Corporation: *See*—
Friedman, Ronald L.; and Lewis, Roger N., 4,057,567, Cl. 260-453.0RZ.

Arikawa, Hiroo; Akiyama, Fumitake; and Maruo, Masaya. Miniature time-delay fuse. 4,057,774, Cl. 337-164.000.

Arima, Tatsuhiro, to Nissan Motor Co., Ltd. Vehicle occupant restraining belt arrangement. 4,057,290, Cl. 297-389.000.

Arizona Chemical Company: *See*—
Ruckel, Erwin Richard; and Wang, Long Shyong, 4,057,682, Cl. 526-190.000.

Armco Steel Corporation: *See*—
Slama, Jerry L.; Francis, David J.; and Shepherd, Gordon R., 4,057,185, Cl. 226-1.000.

Arnold, Dan M.: *See*—
Paap, Hans J.; and Arnold, Dan M., 4,057,720, Cl. 250-266.000.

Arnold, Harmon W., to Flex-O-Lators, Inc. Trim retainer device for upholstered cushions. 4,057,292, Cl. 297-452.000.

Artrip, Robert W.; and Klimo, Robert G., to Towmotor Corporation. Firing control oscillator for a solid state switch. 4,057,752, Cl. 318-345.00B.

Aryamane, Avinash P.: *See*—
Williamson, Harold L.; and Aryamane, Avinash P., 4,056,884, Cl. 29-623.000.

Asahi, Satoshi: *See*—
Kimura, Akio; Seki, Kenji; Ukita, Mamoru; Asahi, Satoshi; and Tagami, Sanae, 4,057,600, Cl. 260-878.00B.

Asano, Masahide: *See*—
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,057,629, Cl. 424-177.000.

Asano, Shinzo, to Fuji Shiko Kabushiki Kaisha; and Kabushiki Kaisha Asano Tekkosho. Rolling printing machine. 4,057,013, Cl. 101-212.000.

Ascher, Gerd; and Reinshagen, Hellmuth, to Sandoz Ltd. Certain 5-nitrothiazolylimidazolidine compounds. 4,057,557, Cl. 260-306.80R.

Ash, Eric Albert; and Dias Soares, Oliverio Delfim, to National Research Development Corporation. Optical system using a hologram coupler. 4,057,319, Cl. 350-96.00C.

Askin, Kerim, to Southwire Company. Starting dummy bar positioner for continuous casting of metals. 4,057,096, Cl. 164-49.000.

Asscher, Meir; and Rosin, Hadassa, to Rhone-Progil. Adducts of olefins and trichloromethane phosphonic dichloride. 4,057,578, Cl. 260-543.00P.

Asscher, Meir; and Rosin, Hadassa, to Rhone-Progil. Adducts of olefins and trichloromethane phosphonic dichloride. 4,057,579, Cl. 260-543.00P.

Asselin, Andre A.; Humber, Leslie G.; and Dobson, Thomas A., to American Home Products Corporation. Carbazole acetic acid derivatives. 4,057,559, Cl. 260-315.000.

Association pour le Developpement de l'Enseignement et de la Recherche en Systematique Appliquee (A.D.E.R.S.A.): *See*—
Timsit, Claude, 4,057,795, Cl. 340-347.0AD.

Asthana, Abhaya; and Hannauer, George, to Electronic Associates, Inc. Analog switching system with fan-out. 4,057,711, Cl. 364-600.000.

Atchisson, Maxwell G. Open bolt conversion apparatus. 4,057,003, Cl. 89-138.000.

Ateliers des Charmilles S.A.: *See*—
Pfau, Jean, 4,057,703, Cl. 219-69.00C.

Atencio, Jimmie P. Engineering and educational table and method of use. 4,056,892, Cl. 35-10.000.

Atex, Incorporated: *See*—
Ying, Charles W.; and Ying, Richard, 4,057,849, Cl. 364-200.000.

Atkiss, Thomas Clifford; and Keen, William Elgin, Jr., to Pennwalt Corporation. Scale reducer for zinc phosphating solutions. 4,057,440, Cl. 148-6.15Z.

Atlantic Richfield Company: *See*—
Striegler, John H., 4,057,116, Cl. 173-165.000.

Audykowski, Thaddeus, to Ciba-Geigy Corporation. Process for the production of quick-curing epoxide resin coatings which are resistant to chemicals and to weathering. 4,057,664, Cl. 427-386.000.

Automation Industries, Inc.: *See*—
van Valkenburg, Howard E.; and McCarroll, Vincent P., 4,056,971, Cl. 73-629.000.

Automatisme & Technique: *See*—
Lacombe-Allard, Jean Francois, 4,057,702, Cl. 219-10.55A.

Automobiles Peugeot: *See*—
Colinet, Andre, 4,057,271, Cl. 292-87.000.

Axen, Udo F., to Upjohn Company, The. 2,2-Difluoro-16-phenoxy-13,14-dihydro-PGA$_2$ analogs. 4,057,574, Cl. 560-53.000.

Ayerst, McKenna & Harrison Ltd.: *See*—
Bagli, Jehan F.; and Bogri, Tibor, 4,057,556, Cl. 424-305.000.

B. E. Wallace Products Corporation: *See*—
Wallace, Bernard E., 4,057,218, Cl. 254-167.000.

B/W Controls Inc.: *See*—
Bongort, Edgar A.; and Cruickshank, William T., 4,056,979, Cl. 73-313.000.

Babb, Raymond E., to Hanscom, Genevieve I.; Magnuson, Robert M.; and Thomson, Lois J., part interest to each. Color grading apparatus utilizing infrared light source. 4,057,352, Cl. 356-178.000.

Babcock & Wilcox Company, The: *See*—
Nemeth, Joseph Daniel, 4,057,237, Cl. 267-134.000.
Schlichting, John; and Tornow, Robert Norman, 4,057,033, Cl. 122-32.000.

Baber, James R.; and Dershem, Ronald J., to General Motors Corporation. Fluid flow control members. 4,057,080, Cl. 138-44.000.

Bachmann, Wilfried; Gnabs, Christian; Janecka, Kurt; Mundlos, Eberhard; Papenfuhs, Theodor; and Waese, Gerhard, to Hoechst Aktiengesellschaft. Process for isolating 2-hydroxynaphthalene carboxylic acids from reaction mixtures of the alkali metal salts of 2-hydroxynaphthalene with carbon dioxide. 4,057,576, Cl. 260-525.000.

Backlund, Sigurd Alfons, to Kemira Oy. Breathing mask, especially a half mask or a full mask provided with an inner mask. 4,057,057, Cl. 128-142.400.

Bacskai, Robert, to Chevron Research Company. Hydroxylation of unsaturated diols to prepare novel tetraols. 4,057,589, Cl. 260-635.00E.

Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna & Harrison Ltd. Troponyl-oxamic acid derivatives. 4,057,556, Cl. 424-305.000.

Bailey, John M., to Caterpillar Tractor Co. Self-cleaning screen assembly for radiators and method. 4,057,105, Cl. 165-119.000.

Bailey Meter & Controls Limited: *See*—
deVial, Raymond Michael; and Taylor, Philip Maurice, 4,057,721, Cl. 250-301.000.

Bajusz, Harold F.; and Iino, Nobuhiro. Nib and shield for writing implement. 4,057,354, Cl. 401-199.000.

Baker, Alfred Lynn, to RCA Corporation. Sync responsive systems for video disc players. 4,057,826, Cl. 358-4.000.

Balli, Heinz; and Egger, Albert, to Ciba-Geigy Corporation. Certain naphthofurans and method for their manufacture. 4,057,562, Cl. 260-346.710.

Balling, Heinz, to Siemens Aktiengesellschaft. Base frame construction for a liquid ring compressor set. 4,057,368, Cl. 417-313.000.

Ballweber, Edward G.: *See*—
Phillips, Kenneth G.; Ballweber, Edward G.; and Selvarajan, Radhakrishnan, 4,057,580, Cl. 260-567.60P.

Balzers Patent- und Beteiligungs-Aktiengesellschaft: *See*—
Hacman, Dionys; and Keutschegger, Adolf, 4,057,316, Cl. 350-1.000.

Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., to Olinkraft, Inc. Method of packaging and shipping bulk material using reusable outer shell. 4,056,913, Cl. 53-27.000.

Banks, Frank H., to MFE Corporation. Tape cassette drive. 4,057,839, Cl. 360-93.000.

Bardy, Andre; Beydon, Jacqueline; Gobin, Renee; and Hegesippe, Michel, to Commissariat a l'Energie Atomique. Method of tagging excipients with 99M technetium. 4,057,615, Cl. 424-1.000.

Barer, Sol J., to Celanese Corporation. Antifungal compositions of butanediol bis (chloroacetate). 4,057,643, Cl. 424-311.000.

Barnett, David L., to Howard, Robert L. Motorcycle trailer. 4,057,283, Cl. 296-23.00C.

Barnett, Larkin H., III, to Virginia National Bank. Strip shingle alignment fixtures. 4,056,889, Cl. 33-188.000.

Barrett, Joseph J., to Allied Chemical Corporation. Spectroscopic temperature measurement. 4,057,349, Cl. 356-45.000.

Barringer, Anthony Rene, to Barringer Research Limited. Detection of concealed metalliferous deposits, hydrocarbons and explosives. 4,056,969, Cl. 73-28.000.

Barringer, Anthony Rene, to Barringer Research Limited. Spectroscopic apparatus with balanced dual detectors. 4,057,734, Cl. 250-575.000.

Barringer Research Limited: *See*—
Barringer, Anthony Rene, 4,056,969, Cl. 73-28.000.
Barringer, Anthony Rene, 4,057,734, Cl. 250-575.000.

Barry Wright Corporation: *See*—
Schubert, Dale W., 4,057,212, Cl. 248-358.00R.

BASF Aktiengesellschaft: *See*—
Fischer, Adolf, deceased, 4,057,414, Cl. 71-88.000.

Basil, Richard V., Jr.; Ondrups, Leons; and Shimizu, James K., to Hughes Aircraft Company. Thermally compensated microwave resonator. 4,057,772, Cl. 333-83.00T.

Bataev, Mikhail Kirillovich; Veits, Isaak Efimovich; Gorodetsky, Sergei Sergeevich; Macheret, Lev Ilich; Kuznetsov, Lev Alexeevich; Tjurin, Albert Vasilievich; and Yaunzem, Jury Eduardovich, to Vsesoiuzny Proektno-Izyskatelsky Nauchno-Issledovatelsky Institut "Gidroproek" Imeni S. Ya. Zhuka. Method for manufacturing and laying out phase cores for oil-filled cables and a device for accomplishing same. 4,057,453, Cl. 156-390.000.

Bates, Albert M.; and Madera, Anthony J., to United States of America, Navy. Built-in test equipment for sonobuoy. 4,057,778, Cl. 340-2.000.

Bator, James S., to Kennametal Inc. Cutting insert. 4,056,871, Cl. 407-114.000.

Battelle Memorial Institute: *See*—
Lux, Benno; Kurz, Wilfried; Hubert, Jean-Claude; Mollard, Francois; and Walt, Guido, 4,057,097, Cl. 164-60.000.

Bauer, Jochen: *See*—
Kaimann, Walter; Pasternak, Rudolf; and Bauer, Jochen, 4,057,400, Cl. 48-77.000.

Bauman, Bruce K.; Norbeck, Dean K.; and Tollinger, Donald L., to Borg-Warner Corporation. Current regulation system for three-phase load. 4,057,842, Cl. 361-93.000.

Bay City Foundry Company: *See*—
Holman, Scott L., 4,057,209, Cl. 248-13.000.

Bayer Aktiengesellschaft: *See*—
Biedermann, Wolfgang; and Koller, Horst, 4,057,513, Cl. 252-459.000.

Bohnsack, Gerhard; Geffers, Hans; Kallfass, Herbert; and Radt, Walter, 4,057,511, Cl. 252-389.00A.
Dickore, Karlfried; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,057,417, Cl. 71-93.000.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Eue, Ludwig, 4,057,418, Cl. 71-103.000.
Kackstaedter, Klaus; and Theidel, Hans, 4,057,387, Cl. 8-1.00W.
Krall, Hermann-Dieter; Weissel, Oskar; and Schwarz, Hans-Helmut, 4,057,581, Cl. 260-571.000.
Merz, Walter; and Nachtsheim, Dieter, 4,057,583, Cl. 260-593.00R.
Muschelknautz, Edgar; Burkholz, Armin; Wieschen, Hermann; Guth, Hans; and Richter, Wolfgang, 4,057,075, Cl. 137-171.000.
Naumann, Klaus; Lurssen, Klaus; Sasse, Klaus; Holtschmidt, Ulrich; and Schwarzmann, Gunter, 4,057,413, Cl. 71-76.000.
Timmler, Helmut; and Draber, Wilfried, 4,057,546, Cl. 544-182.000.
Wagner, Klaus; Eue, Ludwig; Schmidt, Robert R.; and Roos, Ernst, 4,057,419, Cl. 71-121.000.

Bayley, David Pryce: *See*—
Davies, Graham Arthur; Jeffreys, Godfrey Vaughan; and Bayley, David Pryce, 4,057,493, Cl. 210-23.00R.

Bean, Lloyd F., to Xerox Corporation. Single component color development system. 4,057,340, Cl. 355-4.000.

Beck, Henry E.; and Collins, Terry R. Brake mechanism with spring applied fluid pressure released assembly. 4,057,297, Cl. 303-71.000.

Beckham, Robert R., to Libbey-Owens-Ford Company. Mirror mount applying method. 4,057,451, Cl. 156-320.000.

Becton, Dickinson and Company: *See*—
Kaufman, Joseph; and Prais, Alois G., 4,057,052, Cl. 128-2.00F.

Bedortha, James L.: *See*—
Ross, George P.; and Bedortha, James L., 4,057,232, Cl. 266-227.000.

Bell & Howell Company: *See*—
Fleischman, Andor A., 4,057,329, Cl. 350-222.000.

Bell Telephone Laboratories, Incorporated: *See*—
Angner, Ronald Joseph; Blount, Marion Lee; and Lacy, James Volney, 4,057,693, Cl. 179-99.000.
Gitlin, Richard Dennis; and Thompson, John Stewart, 4,057,696, Cl. 179-170.200.
Marcatili, Enrique Alfredo Jose, 4,057,320, Cl. 350-96.0GN.
Miller, Calvin Max, 4,057,448, Cl. 156-158.000.

Bellenbaum, Herbert: *See*—
Mausolf, Georg; Bellenbaum, Herbert; and Dietrich, Josef, 4,057,139, Cl. 198-509.000.

Bemis Company, Inc.: *See*—
Livingston, Wayne W.; and Melin, Gerald W., 4,057,449, Cl. 156-167.000.

Bemos, Charles. Collapsible folding beds for vehicles. 4,057,285, Cl. 296-23.00H.

Bendix Corporation: *See*—
Kiwior, Alexander Michael; and Bode, James Daniel, 4,057,190, Cl. 239-558.000.

Bendix-Westinghouse Limited: *See*—
Taig, Alistair Gordon, 4,057,079, Cl. 137-625.230.

Bennes Marrel, Zone Industrielle: *See*—
Guillot, Jack, 4,057,102, Cl. 165-8.000.

Bennett, Robert P.; and Kukin, Ira, to Apollo Chemical Corporation. Process for reducing the fusion point of coal ash. 4,057,398, Cl. 44-4.000.

Bennett, William J. Piano teaching aid. 4,056,999, Cl. 84-479.000.

Bensalem, Djemal Eddine. Method of treating food products with selenium salts. 4,057,649, Cl. 426-15.000.

Beran, Josef: *See*—
Klinger, Friedrich; Beran, Josef; and Brezina, Jan, 4,056,974, Cl. 73-92.000.

Berardi, Paolo: *See*—
Bruno, Roberto; Memmi, Massimo; Berardi, Paolo; and Musso, Augusto, 4,057,424, Cl. 75-178.00A.

Berg, David W., to Tol-O-Matic, Inc. Seal assembly. 4,057,257, Cl. 277-4.000.

Berger, Julius; Reichelt, Karen Emalyn; and Schuep, Willy, to Hoffmann-La Roche Inc. Certain pyrano-furo-azuleno-pyridines. 4,057,553, Cl. 260-295.00A.

Berger, Pierre, to Creusot-Loire. Device for degassing plastic materials. 4,057,376, Cl. 425-73.000.

Berges, David A., to SmithKline Corporation. 7-(α-Substituted phenylacetamido)-3-(1-carboxymethylthioethyltetrazolyl-5-thiomethyl)-3-cephem-4-carboxylic acids. 4,057,631, Cl. 424-246.000.

Bergfeld, Manfred: *See*—
Zengel, Hans-Georg; and Bergfeld, Manfred, 4,057,588, Cl. 260-621.00R.

Berkowitz, Sidney: *See*—
Meadow, Morton; and Berkowitz, Sidney, 4,057,613, Cl. 423-443.000.

Bermingham, Christopher William, to Bermingham Construction Limited. Auger spoil disposal box. 4,057,117, Cl. 175-88.000.

Bermingham Construction Limited: *See*—
Bermingham, Christopher William, 4,057,117, Cl. 175-88.000.

Bernardo, Gerald; and Jackson, Richard Malcolm Clive, to Schlegel (U.K.) Limited. Surface waterstops. 4,056,909, Cl. 52-396.000.

Bertin & Cie: *See*—
Laurent, Jacky Adrien Paul; and Croix-Marie, Francis Jean-Marie, 4,057,018, Cl. 104-48.000.

Bestmann, Hans Jurgen; Stransky, Werner Theo; and Vostrowsky, Otto, to Hoechst Aktiengesellschaft. Process for preparing cis-olefins. 4,057,593, Cl. 260-682.000.

Bettonica, Luigi. Hydraulic press, particularly for the shaping and pressing of cylindric, or truncated-cone, or like shaped hollow ceramic articles. 4,057,383, Cl. 425-405.00H.

Beydon, Jacqueline: *See*—
Bardy, Andre; Beydon, Jacqueline; Gobin, Renee; and Hegesippe, Michel, 4,057,615, Cl. 424-1.000.

Bick, Rodger L., to Wilson, William L.; Bick, Rodger L.; and Fekete, Lajos F. Removal of hepatitis associated antigen from plasma. 4,057,628, Cl. 424-101.000.

Biddle, Richard A., to Thiokol Corporation. Solid propellant with burning rate catalyst. 4,057,441, Cl. 149-19.900.

Biedermann, Wolfgang; and Koller, Horst, to Bayer Aktiengesellschaft. Hydrogenation catalyst and process for preparing same. 4,057,513, Cl. 252-459.000.

Biere, Helmut; Ahrens, Hanns; Rufer, Clemens; Schroder, Eberhard; and Koch, Henning, to Schering Aktiengesellschaft. 5,6,7,8-Tetrahydrocarbazole-1-carboxylic acid derivatives. 4,057,640, Cl. 424-274.000.

Bigi, Emanuele, to S.I.A.D. Societa' Italiana Acetilene E Derivati. Method and apparatus for recovering argon from an air fractionating process. 4,057,407, Cl. 62-22.000.

Biller, Bruce A., to S & C Electric Company. Support assembly for fusible element of a high voltage fuse. 4,057,775, Cl. 337-186.000.

Billings Energy Research Corporation: *See*—
Campbell, Barrie C., 4,057,479, Cl. 204-258.000.

Biloff, Elmer E. Hand held powered metal clinching tool. 4,056,870, Cl. 29-21.100.

Bimmerle, Charles F.; Braig, James R.; and Vilums, Ivars J. Motion responsive alarm system. 4,057,791, Cl. 340-261.000.

Binegar, Ernest W. Vehicle light switch apparatus. 4,057,742, Cl. 307-10.0LS.

Binz, Robert D.: *See*—
Blewitt, Donald D.; and Binz, Robert D., 4,057,776, Cl. 337-295.000.

Bio-Gas Corporation: *See*—
Boblitz, Oliver W., 4,057,401, Cl. 48-111.000.

Bioresearch Limited: *See*—
Fiecchi, Alberto, 4,057,686, Cl. 536-26.000.

Biospherics Incorporated: *See*—
Schrot, Joseph R., 4,057,470, Cl. 195-127.000.

Bischof, Kaspar: *See*—
Victor, George; Fisher, Robert G.; and Bischof, Kaspar, 4,057,160, Cl. 215-318.000.

Bishop, Forest M. Golf swing aid. 4,057,255, Cl. 273-189.00R.

Bislew, John E., to J. I. Case Compny. Hose coupling retainer assembly. 4,057,269, Cl. 285-158.000.

Black, Edith. Pierced earring having perfuming means. 4,056,951, Cl. 63-13.000.

Blaine, Geneva, executrix: *See*—
Blaine, Neil Franklin, deceased; and Blaine, Geneva, executrix, 4,057,485, Cl. 208-11.0LE.

Blaine, Neil Franklin, deceased; and by Blaine, Geneva, executrix. Solvent extraction of oil from tar sands utilizing a chlorinated ethane solvent. 4,057,485, Cl. 208-11.0LE.

Blanchier, Jean-Claude, to Jaeger. Device for transmitting the condition of a switch between two parts in relative rotary movement. 4,057,783, Cl. 340-58.000.

Blank, Paul Clifford. Collapsible camper. 4,057,284, Cl. 296-23.00F.

Blank, Werner Josef, to American Cyanamid Company. Stable, aged, coating composition. 4,057,523, Cl. 260-29.4UA.

Blanz, John, to United States of America, Interior. Flexible shaft for a roof drill. 4,057,115, Cl. 173-160.000.

Blewitt, Donald D.; and Binz, Robert D., to Westinghouse Electric Corporation. Fuse with radially oriented elements. 4,057,776, Cl. 337-295.000.

Block Drug Company, Inc.: *See*—
Roth, Richard C., 4,057,060, Cl. 128-232.000.

Blount, Marion Lee: *See*—
Angner, Ronald Joseph; Blount, Marion Lee; and Lacy, James Volney, 4,057,693, Cl. 179-99.000.

Blume, Friedrich, to Braun Aktiengesellschaft. Shear foil and method of making the same. 4,056,992, Cl. 76-104.00R.

Boblitz, Oliver W., to Bio-Gas Corporation. Methane gas process and apparatus. 4,057,401, Cl. 48-111.000.

Bode, James Daniel: *See*—
Kiwior, Alexander Michael; and Bode, James Daniel, 4,057,190, Cl. 239-558.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Piesche, Helfried, 4,057,755, Cl. 324-62.000.

Boelens, Harmannus; Maessen, Jan Theodor Marie Francois; and van der Linde, Leendert Maarten, to N.V. Chemische Fabriek "Naarden". Perfume compositions. 4,057,515, Cl. 252-522.000.

Boelens, Harmannus; and Wobben, Hendrik Jacob, to Naarden International, N.V. Preparing perfumed compositions containing 8-allyl-8-hydroxytricyclo[5,2.1.$0^{2,6}$]decane alone or combined with O-hydroxybenzyl ethyl ether. 4,057,516, Cl. 252-522.000.

Boer, Werner: *See*—
Warnke, Hans; and Boer, Werner, 4,057,006, Cl. 91-487.000.

Bogri, Tibor: *See*—
Bagli, Jehan F.; and Bogri, Tibor, 4,057,556, Cl. 424-305.000.

Bohnsack, Gerhard; Geffers, Hans; Kallfass, Herbert; and Radt, Walter, to Bayer Aktiengesellschaft. Process for preventing corrosion and the formation of scale in water circulating system. 4,057,511, Cl. 252-389.00A.

Bom, Cornelis Johannes Gerardus: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,057,111, Cl. 172-72.000.

Bond, James A.; Eckard, Spurgeon E.; and Schnacke, Arthur W., to General Electric Company. Low temperature cooler/condenser. 4,056,946, Cl. 62-121.000.

Bongort, Edgar A.; and Cruickshank, William T., to B/W Controls Inc. Liquid level sensor. 4,056,979, Cl. 73-313.000.

Bonsignore, Salvatore J.; and Howell, Sabert N., to CBS Inc. Controlled dimmer lighting system. 4,057,751, Cl. 315-316.000.

Boon, William David. Log transporter. 4,057,262, Cl. 280-78.000.

Borden, Inc.: *See*—
Columbus, Peter Spiros, 4,057,527, Cl. 260-29.6WB.

Boretos, John W.; and Poirier, Robert A., to United States of America, Health, Education and Welfare. Aortic heart valve catheter. 4,056,854, Cl. 3-1.500.

Borg-Warner Corporation: *See*—
Bauman, Bruce K.; Norbeck, Dean K.; and Tollinger, Donald L., 4,057,842, Cl. 361-93.000.
Gatewood, Sidney Ulane, 4,057,134, Cl. 192-111.00A.
Tuzson, John J., 4,057,133, Cl. 192-103.00F.

Borginon, Hendrik Alfons: *See*—
De brabandere, Luc Achiel; Pollet, Robert Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, 4,057,429, Cl. 96-94.00R.

Borkenstein, Robert Frank: *See*—
Adrian, Werner Karl; and Borkenstein, Robert Frank, 4,057,724, Cl. 250-343.000.

Bormann, Gerhard; and Troxler, Franz, to Sandoz Ltd. 1,2,2a,3,4,5 Hexahydrobenz[c,d]indol-1-yl-2-guanidines. 4,057,560, Cl. 260-326.860.

Borsuk, Alvin; and Johnson, Charles H., to Oscar Mayer & Co. Inc. Method of forming foodstuffs having a uniform cross-section. 4,057,653, Cl. 426-513.000.

Bosshold, Barry L. Vented test tube top. 4,057,168, Cl. 220-209.000.

Bottazzini, Franco; and Donati, Laura, to K.D. Ottica s.n.c. System for locking, in an easily disengageable manner, the lenses to eyeglasses, sportive swimming goggles or diving masks and similar general sportive articles, and the resulting articles. 4,056,853, Cl. 2-443.000.

Boudot, Jean E.; and Joly, Pascal A. J., to Corning Glass Works. Optical glasses. 4,057,435, Cl. 106-47.00Q.

Braat, Josephus Johannes Maria, to U.S. Philips Corporation. Centering detection system for an apparatus for playing optically readable record carriers. 4,057,833, Cl. 358-128.000.

Brace, Arthur A.; and Lesnewich, Alexander, to Airco, Inc. Methods for dissolving volatile addition agents in molten metal. 4,057,420, Cl. 75-53.000.

Bracht, Lothar: *See*—
Fangmeier, Ralf; and Bracht, Lothar, 4,056,958, Cl. 72-98.000.

Brackenridge, David R.: *See*—
Dubeck, Michael; and Brackenridge, David R., 4,057,531, Cl. 260-45.95R.

Bradbury, William B.; Watts, Robert H.; and Scott, E. Timm, to PMS Consolidated. Apparatus for introducing controlled amounts of pigment into thermomechanically formed plastic articles. 4,057,193, Cl. 241-281.000.

Braden, Harold C. Sound suppressor. 4,057,124, Cl. 181-242.000.

Braig, James R.: *See*—
Bimmerle, Charles F.; Braig, James R.; and Vilums, Ivars J., 4,057,791, Cl. 340-261.000.

Brammall, Inc.: *See*—
Van Gompel, James J., 4,057,274, Cl. 292-259.00R.

Brandstetter, Walter: *See*—
Reichel, Kurt; Decker, Gerd; Kuck, Hans-Alfred; and Brandstetter, Walter, 4,057,038, Cl. 123-32.0SP.

Bratschitsch, John. Fluid transfer systems and valves therefor. 4,057,364, Cl. 417-34.000.

Braun Aktiengesellschaft: *See*—
Blume, Friedrich, 4,056,992, Cl. 76-104.00R.

Brettrager, Henry J. Sheet slitter and punch assembly. 4,056,993, Cl. 83-82.000.

Breunsbach, Rex L.: *See*—
Korb, A. Norman; and Breunsbach, Rex L., 4,057,817, Cl. 354-298.000.

Brezina, Jan: *See*—
Klinger, Friedrich; Beran, Josef; and Brezina, Jan, 4,056,974, Cl. 73-92.000.

Brinkley, Max D., to Goodyear Tire & Rubber Company, The. Closed torus tire. 4,057,445, Cl. 156-121.000.

British Petroleum Company Limited, The: *See*—
King, Robert Paul, 4,057,082, Cl. 138-99.000.

Broll, Madeleine: *See*—
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Werbenec, Jean-Pierre; and Broll, Madeleine, 4,057,644, Cl. 424-325.000.

Bromwich, Robert Alan Charles, to Foster Wheeler Energy Corporation. Testing of inaccessable parts. 4,056,972, Cl. 73-620.000.

Broussard, Leo P., to Shell Oil Company. Completing wells in deep reservoirs containing fluids that are hot and corrosive. 4,057,108, Cl. 166-314.000.

Brown, Kevin: *See*—
Appleton, Richard Anthony; and Brown, Kevin, 4,057,641, Cl. 424-283.000.

Brown, Robert A., to Rem Metals Corporation. Oxyfluoride-type mold for casting molten reactive and refractory metals. 4,057,433, Cl. 106-38.300.

Brownell, Roy D.; and Lawrence, Dean M., to Caterpillar Tractor Co. Control arrangement for a vehicle with an adjustable seat. 4,057,122, Cl. 180-77.00S.

Brubaker, Hiram A.; Simmons, Gerald P.; and Streight, William E., to Caterpillar Tractor Co. Peripherally cooled laser lens assembly. 4,057,332, Cl. 350-319.000.

Brucato, Jacqueline I.; and Brucato, Steve J. Water actuated plant fertilizing device. 4,056,898, Cl. 47-48.500.

Brucato, Steve J.: *See*—
Brucato, Jacqueline I.; and Brucato, Steve J., 4,056,898, Cl. 47-48.500.

Brucher, Eberhard; and Schussler, Karl-Heinz, to Dango & Dienenthal. Taphole boring or plugging machine for shaft furnaces, especially blast furnaces. 4,057,234, Cl. 266-272.000.

Bruckenstein, Stanley; and Sherwood, William G., to United States of America, Interior. Electrochemical gas monitor. 4,057,478, Cl. 204-195.00P.

Bruno, Roberto; Memmi, Massimo; Berardi, Paolo; and Musso, Augusto, to Italsider S.p.A. Zinc-based alloy for coating steel. 4,057,424, Cl. 75-178.00A.

Buchin, Michael P.: *See*—
Muehllehner, Gerd; and Buchin, Michael P., 4,057,727, Cl. 250-363.00S.

Buczak, Edwin J. Assembling hand grips onto handles. 4,056,875, Cl. 29-234.000.

Budzak, Paul A.; and Clinton, Russell M., III, to Gulf Research & Development Company. Method for octane monitoring. 4,057,393, Cl. 23-230.0PC.

Buhrman, Willem M.: *See*—
van Amerongen, Evert; and Buhrman, Willem M., 4,057,070, Cl. 134-83.000.

Bulian, Gerd: *See*—
Lossack, Edgar; Kramer, Kurt; and Bulian, Gerd, 4,057,100, Cl. 164-418.000.

Bunch, G. W.: *See*—
Laurie, Albert F.; and Bunch, G. W., 4,057,141, Cl. 206-304.000.

Bunczk, Charles Joseph: *See*—
Graver, Clair Warren; Carwheel, Clarence Edward; and Bunczk, Charles Joseph, 4,057,503, Cl. 252-8.700.

Bunger, David A., to D. H. Baldwin Company. Electronic music system. 4,056,996, Cl. 84-1.190.

Bunker Ramo Corporation: *See*—
Mathe, Istvan; and Kasper, Alan Henry, 4,057,314, Cl. 339-97.00R.

Buono, Frank S. Apparatus and method for separation of blood. 4,057,499, Cl. 210-136.000.

Burcan International Limited: *See*—
Wager, Oleg, 4,057,500, Cl. 210-170.000.

Burford, Charles E.; and West, Joe E., to Burford Corporation. Downstroke baler. 4,057,009, Cl. 100-46.000.

Burford Corporation: *See*—
Burford, Charles E.; and West, Joe E., 4,057,009, Cl. 100-46.000.

Burgess, John E.: *See*—
Meyer, Rolf; and Burgess, John E., 4,057,148, Cl. 211-74.000.

Burk, Gerhard: *See*—
Schwuchow, Norbert; Burk, Gerhard; and Rothacker, Dietrich, 4,057,263, Cl. 280-106.00R.

Burkard, Edward A.: *See*—
Stiling, Rodney A.; Burkard, Edward A.; and Johnson, Robert M., 4,057,443, Cl. 156-43.000.

Burkhardt, Paul Johannes; and Poponiak, Michael Robert, to International Business Machines Corporation. Porous silicon dioxide moisture sensor and method for manufacture of a moisture sensor. 4,057,823, Cl. 357-52.000.

Burkholder, Marie L. Yard and garden tool. 4,057,277, Cl. 294-50.800.

Burkholz, Armin: *See*—
Muschelknautz, Edgar; Burkholz, Armin; Wieschen, Hermann; Guth, Hans; and Richter, Wolfgang, 4,057,075, Cl. 137-171.000.

Burklin, Max: *See*—
Paule, Kurt; Roll, Karl; and Burklin, Max, 4,057,113, Cl. 173-12.000.

Bushnell, James D.; Leighton, Milton D.; and McDonald, Thomas M., to Exxon Research & Engineering Co. Solvent recovery process for N-methyl-2-pyrrolidone in hydrocarbon extraction. 4,057,491, Cl. 208-321.000.

Buss, Benjamin Alvin; and Buss, Stephen A. Laundry folder and stacker. 4,057,241, Cl. 270-82.000.

Buss, Stephen A.: *See*—
Buss, Benjamin Alvin; and Buss, Stephen A., 4,057,241, Cl. 270-82.000.

C. G. Doris (Compagnie Generale pour les Developpements Operationnels des Richesses Sous-marines): *See*—
Lamy, Jacques Edouard, 4,056,944, Cl. 61-107.000.

C. Reichert Optische Werke: *See*—
Schindl, Klaus P., 4,057,318, Cl. 350-19.000.

C. van der Lely N. V.: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,057,111, Cl. 172-72.000.

Cam Gears Limited: *See*—
Adams, Frederick John, 4,057,073, Cl. 137-118.000.

Campbell, Barrie C., to Billings Energy Research Corporation. Solid polymer electrolyte cell construction. 4,057,479, Cl. 204-258.000.

Canadian Patents and Development Limited: *See*—
Meadus, F. Weldon; Sparks, Bryan D.; Puddington, Ira E.; and Farnand, J. Redmond, 4,057,486, Cl. 208-11.0LE.

Candor, James T. Apparatus for removing liquid from liquid bearing material. 4,057,482, Cl. 204-299.00R.

Canon Kabushiki Kaisha: *See*—
Endo, Ichiro; Kobayashi, Hajime; and Takekawa, Nobuhiro, 4,057,016, Cl. 101-465.000.

Ishikawa, Kazuo; Hirata, Noritsugu; Takigawa, Tomoshi; and Yamada, Yasutsugu, 4,057,334, Cl. 352-175.000.
Kumazawa, Kenichi, 4,057,327, Cl. 350-187.000.
Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,057,809, Cl. 354-23.00D.

Canonico, Domenic A.: *See*—
McDonald, Robert E.; and Canonico, Domenic A., 4,056,963, Cl. 72-253.00R.

Canonne, Paul; and Neumann, Gerard, to Societe d'Appareillage Electrique Saparel. Circuit breaker trip and release type control mechanism. 4,057,716, Cl. 200-153.00H.

Canton Textile Mills, Inc.: *See*—
Amos, James W., 4,057,196, Cl. 242-18.0PW.

Caravito, V. A., to Goodyear Tire & Rubber Company, The. Removable tread belt. 4,057,302, Cl. 305-19.000.

Carl Schenck AG: *See*—
Klinger, Friedrich; Beran, Josef; and Brezina, Jan, 4,056,974, Cl. 73-92.000.

Carr, George W., to Pullman Incorporated. Container door securing mechanism. 4,057,273, Cl. 292-218.000.

Carr, Harold F., Jr., to Ernest Holmes Division, Dover Corporation. Winch cable roller assembly. 4,057,202, Cl. 242-157.00R.

Carter, Marvin B.: *See*—
Moe, James S.; Carter, Marvin B.; and Carter, Ray L., 4,057,367, Cl. 417-273.000.

Carter, Philip L.; Kim, Yung K.; and Riley, Michael O., to Dow Corning Corporation. Fluorocarbon siloxane compositions. 4,057,566, Cl. 260-448.20H.

Carter, Ray L.: *See*—
Moe, James S.; Carter, Marvin B.; and Carter, Ray L., 4,057,367, Cl. 417-273.000.

Carwheel, Clarence Edward: *See*—
Graver, Clair Warren; Carwheel, Clarence Edward; and Bunczk, Charles Joseph, 4,057,503, Cl. 252-8.700.

Case, James E.; and Ruppert, Richard L., to Dayton Sure-Grip & Shore Company, The. Method for releasing tilt-up panel hoisting member. 4,056,912, Cl. 52-745.000.

Cassard, Jacques; Lachenal, Jean-Michel; and Romagnolo, Gerard, to Ugine Carbone. Composite guide roller for a rolling mill. 4,056,873, Cl. 29-132.000.

Castaneda, Fernando; and Jimenez, Roy, to Xeltron, S.A. Optical sorting apparatus. 4,057,146, Cl. 209-75.000.

Caterpillar Tractor Co.: *See*—
Bailey, John M., 4,057,105, Cl. 165-119.000.
Brownell, Roy D.; and Lawrence, Dean M., 4,057,122, Cl. 180-77.00S.
Brubaker, Hiram A.; Simmons, Gerald P.; and Streight, William E., 4,057,332, Cl. 350-319.000.
Cockrum, Herbert D.; and Kater, Charles E., 4,057,705, Cl. 219-130.000.
Crumrine, Albert W.; and Fratzke, Lawrence F., 4,057,502, Cl. 210-440.000.
Gibson, Myron R., 4,057,036, Cl. 123-8.090.
Hays, Raymond H.; and Gladden, Kenneth D., 4,057,230, Cl. 266-117.000.
Oldenburg, Dorrance, 4,057,087, Cl. 144-34.00E.
Shaffer, Walter M., 4,056,989, Cl. 74-745.000.
Shaffer, Walter M., 4,057,019, Cl. 104-247.000.
Stedman, Robert N., 4,057,121, Cl. 180-56.000.
Willard, Kaarlela O., 4,056,893, Cl. 37-142.00R.

CBS Inc.: *See*—
Bonsignore, Salvatore J.; and Howell, Sabert N., 4,057,751, Cl. 315-316.000.

Celanese Corporation: *See*—
Barer, Sol J., 4,057,643, Cl. 424-311.000.
Costanza, John R.; DeMartino, Ronald N.; and Goldstein, Arthur M., 4,057,509, Cl. 252-316.000.
Jones, Rufus S., Jr., 4,057,536, Cl. 260-78.00R.
Kalnin, Ilmar L., 4,056,874, Cl. 75-.50R.
Saferstein, Lowell; and Stackman, Robert W., 4,057,532, Cl. 260-47.00C.
Soehngen, John W.; and Hannon, Martin J., 4,057,607, Cl. 264-28.000.

Central Glass Company, Limited: *See*—
Ono, Tetsuhiro; Aramaki, Minoru; Mizuno, Tamotsu; and Fujinaga, Masao, 4,057,614, Cl. 423-490.000.
Ozawa, Masahiro; Inoue, Fumio; Komatsu, Tadaaki; and Matsuoka, Kimiaki, 4,057,591, Cl. 260-653.10R.

Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement: *See*—
Michalon, Daniel, 4,057,017, Cl. 104-20.000.

Centre Technique des Industries de la Fonderie: *See*—
Chaze, Louis G., 4,057,231, Cl. 266-219.000.

Ceraver: *See*—
Willem, Michel, 4,057,687, Cl. 174-179.000.

Chaivre, Joseph W.; and Jadach, Albert A., to Towne Robinson Fastener Company. Method and apparatus for forming a wheel nut with welded cap. 4,056,862, Cl. 10-72.00R.

Chalkley, Lyman. Preparation of dye cyanides. 4,057,563, Cl. 260-390.000.

Champ, Michel Andre: *See*—
Nabucet, Georges Joseph Marie; and Champ, Michel Andre, 4,057,026, Cl. 114-221.00A.

Charbonnages de France: *See*—
Chauvin, Raymond, 4,057,605, Cl. 264-13.000.

Charles, Robert G.: *See*—
Ruka, Roswell J.; and Charles, Robert G., 4,057,101, Cl. 165-1.000.

Charnley, Ralph L.: *See*—
Gaskell, Alfred J.; and Charnley, Ralph L., 4,057,818, Cl. 354-298.000.

Chateau, Louis, to Ducellier & Cie. Depression sensor for an electronic ignition advance device for an internal combustion engine. 4,056,980, Cl. 73-398.0AR.

Chauvin, Raymond, to Charbonnages de France. Manufacture of light granular materials. 4,057,605, Cl. 264-13.000.

Chaze, Louis G., to Centre Technique des Industries de la Fonderie. Cupola furnace. 4,057,231, Cl. 266-219.000.

Chemical Separations Corporation: *See*—
Chopra, Randhir C., 4,057,494, Cl. 210-33.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Kalka, Josef; Waskonig, Walter; and Lueg, Karl, 4,056,981, Cl. 73-421.00B.

Cheney, William A.; and Spurgin, Wendell P., to United Air Specialists, Inc. Means for the cleaning and self-cleaning of an electrostatic precipitator. 4,057,405, Cl. 55-105.000.

Chevron Research Company: *See*—
Bacskai, Robert, 4,057,589, Cl. 260-635.00E.
Grooman, Edward D., 4,057,359, Cl. 415-9.000.
Suzuki, Shigeto, 4,057,577, Cl. 260-535.00P.

Chopra, Randhir C., to Chemical Separations Corporation. Removal of chromium, chromate, molybdate and zinc. 4,057,494, Cl. 210-33.000.

Chrobak, Eryk; Natkaniec, Benedykt; Wasyleczko, Zenon; Stawinski, Antoni; and Roczek, Andrzej, to Fabryka Sprzetu i Narzedzi Gorniczych im. Gen. Karola. Chain quick-connecting link. 4,056,929, Cl. 59-85.000.

Chrysler Corporation: *See*—
Gau, Leonard P., 4,056,977, Cl. 73-272.00R.

Chueh, Chun Fei, to Halcon International, Inc. Recovery of alkylene glycols. 4,057,471, Cl. 203-69.000.

Chujo, Hitoshi: *See*—
Hashimoto, Akihiro; Hayashi, Shigeo; Yamamoto, Sadao; and Chujo, Hitoshi, 4,057,608, Cl. 264-42.000.

Chun, Sun Woong: *See*—
Montagna, Angelo Anthony; Somers, Allen Evarts; Peake, Stephen Luther; and Chun, Sun Woong, 4,057,488, Cl. 208-89.000.

Ciba-Geigy AG: *See*—
Defago, Raymond; Schaffluetzel, Paul; Lapple, Arnulf Ruediger; and Hugelin, Bernard, 4,057,388, Cl. 8-2.50A.
Woodley, George Edward, 4,056,878, Cl. 29-526.00R.

Ciba-Geigy Corporation: *See*—
Audykowski, Thaddeus, 4,057,664, Cl. 427-386.000.
Balli, Heinz; and Egger, Albert, 4,057,562, Cl. 260-346.710.
Haas, Georges; and Rossi, Alberto, 4,057,573, Cl. 560-52.000.
Habermeier, Jurgen, 4,057,558, Cl. 548-305.000.
Hool, Gerhard; and Kundig, Hans, 4,057,648, Cl. 424-341.000.
Karrer, Friedrich; and Farooq, Saleem, 4,057,587, Cl. 260-613.00R.

Cincinnati Mine Machinery Company, The: *See*—
Krekeler, Claude B., 4,057,294, Cl. 299-93.000.

Clairol Incorporated: *See*—
Kunz, Raymond W., 4,057,053, Cl. 128-25.00B.

Clark Equipment Company: *See*—
Robertson, Dean S., 4,057,130, Cl. 192-3.00T.

Clark, John H. Toenail appliance and method. 4,057,055, Cl. 128-81.00A.

Clark, William Frederick; and Maddocks, Richard Joseph, to Lesney Products & Co. Limited. Methods of making a doll having functional inserts. 4,057,612, Cl. 264-275.000.

Clarke, Frederick W., to Rogers and Clarke Manufacturing Co. Mechanism for transferring parts. 4,057,149, Cl. 214-1.0BV.

Clayton Dewandre Company Limited: *See*—
Coupland, Ralph, 4,057,128, Cl. 188-79.50K.

Clingman, Walter L. Hot water flood. 4,057,106, Cl. 166-57.000.

Clinton, Russell M., III: *See*—
Budzak, Paul A.; and Clinton, Russell M., III, 4,057,393, Cl. 23-230.0PC.

Close, Dolores R. Liquid-recycling planter. 4,056,899, Cl. 47-79.000.

Cloyd, John Keen, to Volk & Son Manufacturing Co., Inc. Poultry trussing retainer. 4,056,865, Cl. 17-1.00S.

Coach and Car Equipment Corporation: *See*—
Harder, Arthur J., Jr., 4,057,214, Cl. 248-399.000.

Cockerill-Ougree-Providence et Esperance-Longdoz en abrege "Cockerill": *See*—
Widart, Jean E. L.; and Scailteur, Alain F. C., 4,057,163, Cl. 220-3.000.

Cockerill, William Clyde; Hornung, Louis Michael; Johnson, Donavon William; and Vrba, Richard Alan, to International Business Machines Corporation. Bus steering structure for low cost pipelined processor system. 4,057,846, Cl. 364-200.000.

Cockrum, Herbert D.; and Kater, Charles E., to Caterpillar Tractor Co. Fume extracting welding gun. 4,057,705, Cl. 219-130.000.

Cohen, Morton. Magnetic switch. 4,057,773, Cl. 335-205.000.

Colbeck, Frank Edward: *See*—
Renegar, Charles Gwin; and Colbeck, Frank Edward, 4,057,456, Cl. 156-515.000.

Cole, Edward L.; Hess, Howard V.; and Franz, William F., to Texaco Inc. Process for dewatering carbonaceous materials. 4,057,399, Cl. 44-6.000.

Coleman, Ernest W., to United States of America, Navy. Adaptive direction of arrival antennae system. 4,057,803, Cl. 343-113.00R.

Colgate Palmolive Company: *See—*
Falivene, Pasquale J., 4,057,673, Cl. 428-411.000.
Sung, Steven Lang, 4,057,506, Cl. 252-135.000.
Colinet, Andre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Automobile bonnet ejection and retaining device. 4,057,271, Cl. 292-87.000.
Collins, John D., to Raytheon Company. Recirculating delay line time compressor having plural input taps. 4,057,786, Cl. 365-76.000.
Collins, Terry R.: *See—*
Beck, Henry E.; and Collins, Terry R., 4,057,297, Cl. 303-71.000.
Colmer, Marvin L. Submersible thrust limit switch. 4,057,365, Cl. 417-44.000.
Colquhoun, Joseph A.: *See—*
Rauner, Lawrence A.; and Colquhoun, Joseph A., 4,057,595, Cl. 260-824.00R.
Columbus, Peter Spiros, to Borden, Inc. Aqueous acrylate contact adhesive dispersions. 4,057,527, Cl. 260-29.6WB.
Comben, Richard H., to Medtronic, Inc. Enclosure for and method of enclosing a body implantable pulse generator. 4,057,068, Cl. 128-419.00P.
Commissariat a l'Energie Atomique: *See—*
Bardy, Andre; Beydon, Jacqueline; Gobin, Renee; and Hegesippe, Michel, 4,057,615, Cl. 424-1.000.
Dorffer, Auguste; and Piquard, Jean-Francois, 4,057,069, Cl. 128-421.000.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris": *See—*
Lamy, Jacques Edouard, 4,056,945, Cl. 61-107.000.
Compagnie Maritime d'Expertises - Comex: *See—*
Sicard, Hubert, 4,057,268, Cl. 285-31.000.
Conger, William W., IV: *See—*
Johnson, Lawrence E.; and Conger, William W., IV, 4,057,372, Cl. 417-424.000.
Connlab Holdings Limited: *See—*
Micetich, Ronald G.; Morin, Robert B.; and Wilson, Kenneth E., 4,057,540, Cl. 260-239.00A.
Conroy, John J.: *See—*
Henningsen, Tom; and Conroy, John J., 4,057,770, Cl. 331-94.50Q.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Johannsen, Peter, 4,057,089, Cl. 152-209.00R.
Contraves AG: *See—*
Zust, Harry, 4,057,661, Cl. 427-125.000.
Conwed Corporation: *See—*
Erickson, Gordon A., 4,057,123, Cl. 181-286.000.
Cook, James E. Unloader valve. 4,057,072, Cl. 137-116.000.
Cooper, Glenn Dale; and Schraga, Irwin, to General Electric Company. Process for the preparation of vinyl aromatic-modified polyphenylene ethers. 4,057,599, Cl. 260-874.000.
Cooper Tire and Rubber Company: *See—*
Klose, Karl W., 4,057,455, Cl. 156-410.000.
Cornforth, James L. Buoyant life-saving device. 4,056,861, Cl. 9-14.000.
Corning Glass Works: *See—*
Allen, Richard E., 4,057,707, Cl. 219-543.000.
Boudot, Jean E.; and Joly, Pascal A. J., 4,057,435, Cl. 106-47.00Q.
Pierson, Joseph E.; and Stookey, Stanley D., 4,057,408, Cl. 65-18.000.
Rittler, Hermann L., 4,057,434, Cl. 106-39.700.
Costanza, John R.; DeMartino, Ronald N.; and Goldstein, Arthur M., to Celanese Corporation. Polygalactomannan allyl ether gels. 4,057,509, Cl. 252-316.000.
Coupland, Ralph, to Clayton Dewandre Company Limited. Slack adjusters for vehicle brakes. 4,057,128, Cl. 188-79.50K.
Coverdale, Charles E.; and Skaletzky, Louis L., to Upjohn Company, The. Compositions and method of using quinolylaminobenzoylpiperazino-1-oxides. 4,057,633, Cl. 424-250.000.
Cox, Daniel: *See—*
Jones, Bernard H.; Cox, Daniel; and Gallagher, Don R., 4,057,195, Cl. 242-18.00G.
Craig, Jeffrey M., to Akzona Incorporated. Apparatus for counting crimp in fibers. 4,057,350, Cl. 356-199.000.
Cranston, Benjamin Howell; Kleinedler, Gary Evan; Machusak, Donald Arthur; and Wiechard, Charles Augustus, to Western Electric Company, Inc. Joining wire-like members. 4,057,187, Cl. 228-107.000.
Creekmore, Mark D.; and Panning, Henry F., to Goodyear Tire & Rubber Company, The. Compounded polyvinyl chloride. 4,057,672, Cl. 428-220.000.
Creusot-Loire: *See—*
Berger, Pierre, 4,057,376, Cl. 425-73.000.
Crisp, Michael J.: *See—*
Krikorian, Esther; and Crisp, Michael J., 4,057,476, Cl. 204-192.00P.
Croix-Marie, Francis Jean-Marie: *See—*
Laurent, Jacky Adrien Paul; and Croix-Marie, Francis Jean-Marie, 4,057,018, Cl. 104-48.000.
Crouch, William B.; Fabiero, Carolina P.; and Robin, Allen M., to Texaco Inc. Production of nitrogen rich gas mixtures. 4,057,510, Cl. 252-372.000.
Cruff, Carlton E.; and Day, Edward G., to United Technologies Corporation. Method for making ceramic casting slurries. 4,057,227, Cl. 366-2.000.
Cruickshank, William T.: *See—*
Bongort, Edgar A.; and Cruickshank, William T., 4,056,979, Cl. 73-313.000.
Crumrine, Albert W.; and Fratzke, Lawrence F., to Caterpillar Tractor Co. Seal for cartridge-type filter assemblies. 4,057,502, Cl. 210-440.000.
CS na BSFS: *See—*
Furnadjiev, Vassil Lazarov; and Samardjiev, Boris Krestanov, 4,057,806, Cl. 346-33.00R.
Csoka, Frank S., to Fun Things, Inc. Maze board game apparatus. 4,057,253, Cl. 273-131.0BA.
Cullen Photo Service, Inc.: *See—*
Hutzel, Abraham, 4,057,140, Cl. 206-216.000.
Cunningham, Hugh; and Raetzsch, Carl W., to PPG Industries, Inc. Method of reducing cell liquor header corrosion. 4,057,473, Cl. 204-98.000.
Currie, Grover C. Gutter cleaning apparatus. 4,057,276, Cl. 294-19.00R.
Curt G. Joa, Inc.: *See—*
Hirsch, John L., 4,056,919, Cl. 53-124.00D.
D. H. Baldwin Company: *See—*
Bunger, David A., 4,056,996, Cl. 84-1.190.
Uetrecht, Dale M., 4,056,995, Cl. 84-1.010.
Daghe, Joseph L.; and Kuzmicki, Casimir B., to Mueller Co. Chipless shell cutter for large diameter plastic pipe. 4,057,357, Cl. 408-67.000.
Daiichi Seiyaku Co., Ltd.: *See—*
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,057,629, Cl. 424-177.000.
Daikin Kogyo Co., Ltd.: *See—*
Touzuka, Takashi; and Ohsaka, Yonosuke, 4,057,584, Cl. 260-593.00H.
Daimler-Benz Aktiengesellschaft: *See—*
Schwuchow, Norbert; Burk, Gerhard; and Rothacker, Dietrich, 4,057,263, Cl. 280-106.00R.
Dajani, Esam Z.: *See—*
Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, 4,057,549, Cl. 260-293.540.
Daman, Lloyd W.; Marti, Don V., II; Mason, Freddie; and Shamp, Donald E., to Libbey-Owens-Ford Company. Heat shield for float glass forming apparatus and method of using. 4,057,410, Cl. 65-65.00A.
Damico, Frank M.; and Nass, Raymond D., to Joerns Furniture Company. Examination table. 4,057,240, Cl. 269-325.000.
Dana Corporation: *See—*
Flotow, Richard A., 4,057,131, Cl. 192-70.130.
Dane, George E. Chart viewer. 4,057,730, Cl. 250-461.00R.
Dango & Dienenthal: *See—*
Brucher, Eberhard; and Schussler, Karl-Heinz, 4,057,234, Cl. 266-272.000.
Daniel, Sam M.: *See—*
Greeley, Ashford C.; and Daniel, Sam M., 4,057,708, Cl. 235-413.000.
Danieli, Luigi, to Officine Meccaniche Danieli. Device for oscillating a continuous casting mould. 4,057,099, Cl. 164-260.000.
Danner, Kenneth H., to Rosemount Inc. Heated roll inductive heater construction. 4,056,883, Cl. 29-611.000.
Darden, William T., Jr. Power pack and carrier for CB radio. 4,057,757, Cl. 325-16.000.
Data General Corporation: *See—*
Saxena, Arjun N.; and Hart, Courtney, 4,057,460, Cl. 156-643.000.
Davies, Graham Arthur; Jeffreys, Godfrey Vaughan; and Bayley, David Pryce. Droplet control elements. 4,057,493, Cl. 210-23.00R.
Davies, Peter Kingsley; Rogers, Leslie Richard; Stansfield, James Frederick; and Topham, Arthur, to Imperial Chemical Industries Limited. Dispersion of solids in organic solvents. 4,057,436, Cl. 106-288.00Q.
Davis, George B., Jr. Christmas tree lighting control. 4,057,735, Cl. 307-11.000.
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Jones, Donald J.; and Davis, Guy E., 4,057,715, Cl. 364-494.000.
Davis, Peter Robert, to English Electric Valve Company Ltd. Travelling wave tubes. 4,057,748, Cl. 315-3.500.
Davis, Peter Robert, to English Electric Valve Company Ltd. Travelling wave tube having an improved magnetic focussing field. 4,057,749, Cl. 315-3.500.
Davis, Robert S.: *See—*
Wiggins, Glenn C.; Kreh, Marvin J.; and Davis, Robert S., 4,057,667, Cl. 428-35.000.
Davy-Loewy Limited: *See—*
Howard, David Robert, 4,056,957, Cl. 72-19.000.
Dawdy, Jack A., to National Gypsum Company. Wallboard application method and apparatus therefor. 4,056,904, Cl. 52-127.000.
Day, Edward G.: *See—*
Cruff, Carlton E.; and Day, Edward G., 4,057,227, Cl. 366-2.000.
Dayton Sure-Grip & Shore Company, The: *See—*
Case, James E.; and Ruppert, Richard L., 4,056,912, Cl. 52-745.000.
DCA Food Industries, Inc.: *See—*
Kaufman, Harold B., Jr., 4,056,950, Cl. 62-381.000.
DeBortoli, George; and Zimmermann, Detlef, to Northern Telecom Limited. Protector apparatus for telecommunications lines. 4,057,692, Cl. 179-98.000.
De brabandere, Luc Achiel; Pollet, Robert Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, to AGFA-GEVAERT, N. V. Preparation of photographic silver halide emulsions. 4,057,429, Cl. 96-94.00R.
Decker, Gerd: *See—*
Reichel, Kurt; Decker, Gerd; Kuck, Alfred; and Schulz, Erwin, 4,057,037, Cl. 123-32.0SP.
Reichel, Kurt; Decker, Gerd; Kuck, Hans-Alfred; and Brandstetter, Walter, 4,057,038, Cl. 123-32.0SP.

de Cointet de Fillain, Paul: *See—*
Pigerol, Charles; de Cointet de Fillain, Paul; Nanthavong, Souli; and Le Blay, Jacques, 4,057,530, Cl. 260-45.80N.
Deeks, Ronald George, to Procor Limited. Railroad car. 4,057,155, Cl. 214-83.280.
Deere & Company: *See—*
Nelson, Roger John, 4,057,109, Cl. 172-7.000.
Reich, Steven Anthony, 4,057,044, Cl. 123-140.0MP.
Ring, Curtis Phillip, 4,057,005, Cl. 91-413.000.
Sisk, Robert Michael; and Williams, Lary Lynn, 4,057,701, Cl. 200-213.000.
Defago, Raymond; Schaffluetzel, Paul; Lapple, Arnulf Ruediger; and Hugelin, Bernard, to Ciba-Geigy AG. Dry heat process for dyeing and printing organic material which can be dyed with cationic dyestuffs. 4,057,388, Cl. 8-2.50A.
Dege, Gerald J.: *See—*
Lee, Lester T. C.; Dege, Gerald J.; and Liu, Kang-Jen, 4,057,481, Cl. 204-296.000.
DeMartino, Ronald N.: *See—*
Costanza, John R.; DeMartino, Ronald N.; and Goldstein, Arthur M., 4,057,509, Cl. 252-316.000.
Dembski, Gary R. Tethered decoy. 4,056,890, Cl. 43-3.000.
de Mos, Jacob Mink; and Koek, Pieter, to N.V. Machinefabriek Terlet. Mixing device. 4,057,226, Cl. 366-244.000.
Denker, James M., to Nutron Corporation. Rotary fluid device having two rotor sections. 4,057,007, Cl. 91-501.000.
de Rook, Poppe, to Akzo N.V. Process for preparing frost resistant concrete. 4,057,526, Cl. 260-29.60S.
Dershem, Ronald J.: *See—*
Baber, James R.; and Dershem, Ronald J., 4,057,080, Cl. 138-44.000.
Deutsche Texaco Aktiengesellschaft: *See—*
Pusch, Gunter; and Gedenk, Rudolf, 4,057,107, Cl. 166-260.000.
deVial, Raymond Michael; and Taylor, Philip Maurice, to Bailey Meter & Controls Limited. Oil pollution monitoring and monitoring unit. 4,057,721, Cl. 250-301.000.
de Vries, Robert. Detachable link-chain. 4,056,928, Cl. 59-83.000.
Dey, Arabinda N., to P. R. Mallory & Co. Inc. Organic electrolyte batteries. 4,057,679, Cl. 429-194.000.
Di/An Controls, Inc.: *See—*
Kodis, Robert D., 4,057,015, Cl. 101-93.290.
Dias Soares, Oliverio Delfim: *See—*
Ash, Eric Albert; and Dias Soares, Oliverio Delfim, 4,057,319, Cl. 350-96.00C.
Dickore, Karlfried; Eue, Ludwig; and Schmidt, Robert Rudolf, to Bayer Aktiengesellschaft. 6-Sec.-butyl-1,2,4-triazin-5(4H)-one compounds and herbicidal compositions. 4,057,417, Cl. 71-93.000.
Diemer, R. Bertrum, Jr.; and Dunson, James B., Jr., to Du Pont de Nemours, E. I., and Company. Method for separating immiscible fluids of different density. 4,057,404, Cl. 55-90.000.
Dietrich, Josef: *See—*
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Dimitriadis, James Christ. Animal bathing apparatus. 4,057,032, Cl. 119-1.000.
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Asselin, Andre A.; Humber, Leslie G.; and Dobson, Thomas A., 4,057,559, Cl. 260-315.000.
Dr. -Ing. Rudolf Hell GmbH: *See—*
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Dr. Johannes Heidenhain GmbH: *See—*
Ernst, Alfons; and Reichl, Alfred, 4,057,258, Cl. 277-12.000.
Doelling, Sylvia Lee. Dressmaker's aid with rotating platform. 4,056,886, Cl. 33-10.000.
Doelves, Juergen; and Herforth, Dieter, to Dr. -Ing. Rudolf Hell GmbH. Process and apparatus for exactly adjusting the beginning and end of reproducing in an engraving unit. 4,057,838, Cl. 358-299.000.
Dolder, Adelheid: *See—*
Dolder, Hans, 4,056,907, Cl. 52-266.000.
Dolder, Hans, to Dolder, Adelheid. Building blocks and support structure. 4,056,907, Cl. 52-266.000.
Dollinger, Kenneth, to Sanders Associates, Inc. Sidelobe cancellation system. 4,057,802, Cl. 343-100.0LE.
Donati, Laura: *See—*
Bottazzini, Franco; and Donati, Laura, 4,056,853, Cl. 2-443.000.
Donovan, William F., to United States of America, Army. Kinetic barrel gun. 4,057,002, Cl. 89-8.000.
Dorffer, Auguste; and Piquard, Jean-Francois, to Commissariat a l'Energie Atomique. Method of nerve stimulation and a stimulator for the application of the method. 4,057,069, Cl. 128-421.000.
Dorn, Conrad P.: *See—*
Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., 4,057,637, Cl. 424-263.000.
Dougherty, Robert S. Cargo container door construction. 4,057,170, Cl. 220-323.000.
Dow Chemical Company, The: *See—*
Gross, James R., 4,057,521, Cl. 260-29.6HN.
Hunt, David A., 4,057,528, Cl. 260-29.70S.
Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,057,517, Cl. 260-22.00R.
Strycker, Stanley J., 4,057,645, Cl. 424-329.000.
Dow Corning Corporation: *See—*
Carter, Philip L.; Kim, Yung K.; and Riley, Michael O., 4,057,566, Cl. 260-448.20H.
Rauner, Lawrence A.; and Colquhoun, Joseph A., 4,057,595, Cl. 260-824.00R.
Thow, G. Bruce, 4,057,065, Cl. 128-348.000.
Dowling, Donald Hugh, to Du Pont de Nemours, E. I., and Company. Radio-controlled machine power cut-off. 4,057,805, Cl. 343-225.000.
Draber, Wilfried: *See—*
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Driesenga, Edwin J., to Keeler Corporation. Back and bail assembly. 4,056,864, Cl. 16-126.000.
Drummond, Arthur, Jr., to Xerox Corporation. Magnetic brush developer roll for electrostatic reproduction machines. 4,057,666, Cl. 428-35.000.
Dryden, Hugh L., Jr.; Scaros, Mike G.; and Telinski, Thomas J., to G. D. Searle & Co. Process for the preparation of 17β-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactone. 4,057,542, Cl. 260-239.55C.
Dryden, Hugh L., Jr.; and Markos, Charles S., to G. D. Searle & Co. Process for the preparation of 17β-hydroxy-3-oxo-17α-pregn-4-ene-21-carboxylic acid γ-lactone. 4,057,543, Cl. 260-239.570.
Dubeck, Michael; and Brackenridge, David R., to Ethyl Corporation. Fire retardant polystyrene. 4,057,531, Cl. 260-45.95R.
Dubinsky, Emanuel. Removable cover for outdoor-type chairs. 4,057,291, Cl. 297-441.000.
Ducellier & Cie: *See—*
Chateau, Louis, 4,056,980, Cl. 73-398.0AR.
Dumonte, Annie, administratrix: *See—*
Dumonte, Paul, deceased, 4,057,746, Cl. 313-237.000.
Dumonte, Paul, deceased (by Dumonte, Annie, administratrix), to Sciaky Vitry, S. A. Demountable high power electron beam gun. 4,057,746, Cl. 313-237.000.
Duncan, Farris N.: *See—*
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,056,913, Cl. 53-27.000.
Duncan, James W.; and Peck, Walter R., to Stencel Aero Engineering Corporation. Ejection sequencing system with airspeed and altitude sensing. 4,057,206, Cl. 244-147.000.
Duncan, Lee Harold: *See—*
Duncan, Lee Holmes; and Duncan, Lee Harold, 4,057,266, Cl. 280-475.000.
Duncan, Lee Holmes; and Duncan, Lee Harold. Coupling guide for trailer hitches. 4,057,266, Cl. 280-475.000.
Dunlop Limited: *See—*
Goodfellow, Anthony Gerald, 4,057,446, Cl. 156-123.00R.
Holroyd, Eric; Goodfellow, Anthony Gerald; and McGlashen, James Neil, 4,057,447, Cl. 156-125.000.
Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, to Abbott Laboratories. Aminotetralins and use in inducing anesthesia. 4,057,582, Cl. 260-574.000.
Dunning, John M., III, to Dunning, Ltd. Collapsible wall structure for cabinets or chests. 4,057,308, Cl. 312-262.000.
Dunning, Ltd.: *See—*
Dunning, John M., III, 4,057,308, Cl. 312-262.000.
Dunson, James B., Jr.: *See—*
Diemer, R. Bertrum, Jr.; and Dunson, James B., Jr., 4,057,404, Cl. 55-90.000.
Du Pont de Nemours, E. I., and Company: *See—*
Diemer, R. Bertrum, Jr.; and Dunson, James B., Jr., 4,057,404, Cl. 55-90.000.
Dowling, Donald Hugh, 4,057,805, Cl. 343-225.000.
Manzer, Leo Ernest, 4,057,565, Cl. 260-429.00R.
Miller, Norman Jay; Zemaitis, John Anthony; and Zimmerman, Russell Lloyd, 4,057,315, Cl. 339-221.00R.
Schlaf, Thomas Fulton, 4,057,638, Cl. 424-270.000.
Dura Corporation: *See—*
Hansen, Clarence M.; and Ledebuhr, Richard L., 4,057,137, Cl. 198-443.000.
E. & J. Gallo Winery: *See—*
Victor, George; Fisher, Robert G.; and Bischof, Kaspar, 4,057,160, Cl. 215-318.000.
Earth Sciences, Inc.: *See—*
Jennings, Larry D.; and Hazen, Wayne W., 4,057,611, Cl. 423-127.000.
Eastman Kodak Company: *See—*
Enriquez, Philip Maury, 4,057,427, Cl. 96-55.000.
Frank, Lee Fitzpatrick, 4,057,337, Cl. 353-26.00R.
Mowrey, Rowland George; Smith, Donald Arthur; and Sutton, Richard Calvin, 4,057,428, Cl. 96-74.000.
Ebata, Hiroyuki, to Yoshida Kogyo K.K. Net jointing structure. 4,056,868, Cl. 24-205.16C.
Eckard, Spurgeon E.: *See—*
Bond, James A.; Eckard, Spurgeon E.; and Schnacke, Arthur W., 4,056,946, Cl. 62-121.000.
Edeco-West, Inc.: *See—*
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Eder, Ulrich: *See—*
Furst, Andor; Gutzwiller, Jurg; Muller, Marcel; Wiechert, Rudolf; Eder, Ulrich; and Neef, Gunter, 4,057,561, Cl. 260-345.90S.
Egger, Albert: *See—*
Balli, Heinz; and Egger, Albert, 4,057,562, Cl. 260-346.710.
Ehrenhaft, Franz F.; and Rosin, Seymour, to Anamorphic Ltd. Additive lamphouse. 4,057,345, Cl. 355-35.000.
Eisai Co., Ltd.: *See—*
Kijima, Shizumasa; Yamatu, Isao; Hamamura, Kimio; Minami, Norio; Yamagishi, Youji; and Inai, Yuichi, 4,057,568, Cl. 260-462.00R.
Eisma, Benjamin J., Jr., to Sparton Corporation. Welded muffler clamp. 4,056,869, Cl. 24-277.000.
Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; Yoda, Haruo;

and Kameyama, Masayoshi, to Hitachi, Ltd. Group control system for visual information processing. 4,057,845, Cl. 364-200.000.

Electronic Associates, Inc.: *See—*
Asthana, Abhaya; and Hannauer, George, 4,057,711, Cl. 364-600.000.

Elfstrom, Carry Allon, to Arca Holding S.A. Building framework for timber house of log-cabin appearance. 4,056,906, Cl. 52-233.000.

Ellingham, Walter; and Nolan, Edward J. Automatic film transporter. 4,057,346, Cl. 355-41.000.

Ellison, Boris: *See—*
Johnson, Raymond E.; and Ellison, Boris, 4,057,793, Cl. 340-310.00R.

Ellson, George Andrew. Security system. 4,057,798, Cl. 340-420.000.

Elms, Robert T.; Engel, Joseph C.; and Saletta, Gary F., to Westinghouse Electric Corporation. Apparatus and method for sustaining the operation of HID lamps. 4,057,750, Cl. 315-86.000.

Elonen, Kunto, to Rauma-Repola Oy. Retaining member for vehicle chassis. 4,057,286, Cl. 296-43.000.

Elting, Katherine Anne Cline, to Milchem Incorporated. Graft copolymer and process for making same. 4,057,683, Cl. 526-194.000.

Emil Korsch, Spezialfabrik fur Komprimiermaschinen: *See—*
Korsch, Wolfgang, 4,057,381, Cl. 425-345.000.

Endo, Ichiro; Kobayashi, Hajime; and Takekawa, Nobuhiro, to Canon Kabushiki Kaisha. Process for electrostatic printing and apparatus therefor. 4,057,016, Cl. 101-465.000.

Engel, Joseph C.: *See—*
Elms, Robert T.; Engel, Joseph C.; and Saletta, Gary F., 4,057,750, Cl. 315-86.000.

Engins Matra: *See—*
Malinge, Noel, 4,057,336, Cl. 353-6.000.

English Electric Valve Company Ltd.: *See—*
Davis, Peter Robert, 4,057,748, Cl. 315-3.500.
Davis, Peter Robert, 4,057,749, Cl. 315-3.500.

Enriquez, Philip Maury, to Eastman Kodak Company. Peroxide redox amplification imaging using manganese catalyst images. 4,057,427, Cl. 96-55.000.

Environmental Research Institute of Michigan: *See—*
Upatnieks, Juris, 4,057,317, Cl. 350-3.500.

Erickson, Gordon A., to Conwed Corporation. Lightweight sound absorbent panels having high noise reduction coefficient. 4,057,123, Cl. 181-286.000.

Ermans, Andre Marie: *See—*
Abramovici, Jean; Ermans, Andre Marie; and Jeghers, Omer, 4,057,617, Cl. 424-1.000.

Ernest Holmes Division, Dover Corporation: *See—*
Carr, Harold F., Jr., 4,057,202, Cl. 242-157.00R.

Ernst, Alfons; and Reichl, Alfred, to Dr. Johannes Heidenhain GmbH. Measuring arrangement. 4,057,258, Cl. 277-12.000.

ESM Inc.: *See—*
Ferree, Roy E., 4,057,225, Cl. 366-157.000.

Etablissements Carpano & Pons SA: *See—*
Saligny, Yves, 4,057,843, Cl. 361-104.000.

Ethyl Corporation: *See—*
Dubeck, Michael; and Brackenridge, David R., 4,057,531, Cl. 260-45.95R.

Eue, Ludwig: *See—*
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Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Eue, Ludwig, 4,057,418, Cl. 71-103.000.
Wagner, Klaus; Eue, Ludwig; Schmidt, Robert R.; and Roos, Ernst, 4,057,419, Cl. 71-121.000.

Evans, William Robert, to AMP Incorporated. Elastomeric connector for parallel circuit boards. 4,057,311, Cl. 339-17.00M.

Everett, Nicholas Wynne, to Ibis Engineers Limited. Garment pressing machines. 4,057,179, Cl. 223-73.000.

Evrard, Thomas O., to Olin Corporation. Method for using 3-trichloromethyl-5-lower alkoxy-1,2,4-thiadiazole compounds as insecticides and acaricides. 4,057,639, Cl. 424-270.000.

Exxon Research & Engineering Co.: *See—*
Bushnell, James D.; Leighton, Milton D.; and McDonald, Thomas M., 4,057,491, Cl. 208-321.000.
Gorbaty, Martin L., 4,057,681, Cl. 526-185.000.
Lundberg, Robert D.; and Thame, Neville G., 4,057,598, Cl. 260-857.00G.
Metrailer, William J.; and Matula, Joseph P., 4,057,487, Cl. 208-81.000.
Rao, Bhaskara M. L., 4,056,885, Cl. 29-623.100.
Rao, Bhaskara M. L.; and Malachesky, Paul A., 4,057,676, Cl. 429-50.000.
Vadovic, Charles J.; Wesselhoft, Robert D.; and Nahas, Nicholas C., 4,057,512, Cl. 252-413.000.

Eymard, Pierre: *See—*
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Werbenec, Jean-Pierre; and Broll, Madeleine, 4,057,644, Cl. 424-325.000.

F. Meyer & Schwabedissen GmbH & Co. KG.: *See—*
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Fabiero, Carolina P.: *See—*
Crouch, William B.; Fabiero, Carolina P.; and Robin, Allen M., 4,057,510, Cl. 252-372.000.

Fabryka Sprzetu i Narzedzi Gorniczych im. Gen. Karola: *See—*
Chrobak, Eryk; Natkaniec, Benedykt; Wasyleczko, Zenon; Stawinski, Antoni; and Roczek, Andrzej, 4,056,929, Cl. 59-85.000.

Falivene, Pasquale J., to Colgate Palmolive Company. Fabric conditioning with improved composition containing a plasticizer. 4,057,673, Cl. 428-411.000.

Falk Corporation, The: *See—*
Stephens, Robert K., 4,057,126, Cl. 184-11.00R.

Fangmeier, Ralf; and Bracht, Lothar, to Th. Kieserling & Albrecht. Method and apparatus for straightening of elongated workpieces. 4,056,958, Cl. 72-98.000.

Farnand, J. Redmond: *See—*
Meadus, F. Weldon; Sparks, Bryan D.; Puddington, Ira E.; and Farnand, J. Redmond, 4,057,486, Cl. 208-11.0LE.

Farooq, Saleem: *See—*
Karrer, Friedrich; and Farooq, Saleem, 4,057,587, Cl. 260-613.00R.

Farquhar, Norman G.; and Schwab, John A., to Westinghouse Electric Corporation. Process fluid cooling system. 4,057,034, Cl. 122-382.000.

Fayolle, Bernard, to Rhone-Poulenc-Textile. Block-type aryl copolyesters and filaments based on these copolyesters. 4,057,597, Cl. 260-860.000.

Federal Signal Corporation: *See—*
Andrews, Frank; and McKee, Richard W., 4,057,208, Cl. 246-125.000.

Feess, Erich; and Gronen, Willy, to Hoechst Aktiengesellschaft. Process for the printing with developing dyes. 4,057,389, Cl. 8-71.000.

Fekete, Lajos F.: *See—*
Bick, Rodger L., 4,057,628, Cl. 424-101.000.

Felten & Guilleaume Carlswerk AG: *See—*
Rasquin, Werner, 4,057,737, Cl. 307-147.000.

Ferrari, Giorgio; and Krepinsky, Jiri Jan, to Simes Societa Italiana Medicinali e Sintetici S.p.A. Carbamates of ergolines and therapeutic compositions therewith. 4,057,635, Cl. 424-261.000.

Ferree, Roy E., to ESM Inc. Screw feeder for granular material. 4,057,225, Cl. 366-157.000.

Ferrie, Ronald Gilbert: *See—*
Harbert, Donald Duane; and Ferrie, Ronald Gilbert, 4,057,761, Cl. 328-154.000.

Ferry, Michel, to International Business Machines Corporation. Transformer with active elements. 4,057,717, Cl. 364-802.000.

FIAT Societa per Azioni: *See—*
Michellone, Giancarlo; and Maggioni, Virginio, 4,057,300, Cl. 303-113.000.

Fiecchi, Alberto, to Bioresearch Limited. Sulphonic acid salts of S-adenosilmethionine. 4,057,686, Cl. 536-26.000.

Fillmore, William E.; Garver, Wayne E.; Mumford, George V.; and Price, James H., to Owens-Illinois, Inc. Vapor-seal safety cap and container. 4,057,159, Cl. 215-222.000.

Finelli, Anthony F.; Jasani, Shirish; and Williams, Columbus, Jr., to Goodyear Tire & Rubber Company, The. Ethylenically polyurethane unsaturated composition. 4,057,431, Cl. 96-115.00R.

Finnigan, Joseph C. Container and its mounting on a safety harness. 4,057,181, Cl. 224-29.00R.

Firan Electronics, Inc.: *See—*
Mette, Klaus Hermann; and St. Denis, Andrew Raoul, 4,057,713, Cl. 364-476.000.

Firestone Tire & Rubber Company, The: *See—*
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Firsov, Vitaly Mikhailovich: *See—*
Kudryavtsev, Alexandr Alexandrovich; Firsov, Vitaly Mikhailovich; Solinov, Evgeny Fedorovich; Symon, Mark Klavdievich; Litvinov, Pavel Ivanovich; Veresov, Albert Pavlovich; Rybakov, Ivan Alexandrovich; Trishin, Viktor Timofeevich; Goryannikov, Vladimir Mikhailovich; Savin, Vyacheslav Pavlovich; and Kashkarov, Igor Georgievich, 4,057,409, Cl. 65-154.000.

Fischbeck, Kenneth H.; and Vernon, Richard H., to Xerox Corporation. Separable liquid droplet instrument and magnetic drivers therefor. 4,057,807, Cl. 346-140.00R.

Fischer, Adolf, deceased (by Fischer, Caecilia Emma, heiress-at-law), to BASF Aktiengesellschaft. Herbicidal compositions. 4,057,414, Cl. 71-88.000.

Fischer, Caecilia Emma, heiress-at-law: *See—*
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Fischer, Harry C., to United States of America, Energy Research and Development Administration. Bidirectional piston valve. 4,057,074, Cl. 137-107.000.

Fisher, Chester Donald: *See—*
Wert, Edward; and Fisher, Chester Donald, 4,056,867, Cl. 24-37.000.

Fisher, Robert G.: *See—*
Victor, George; Fisher, Robert G.; and Bischof, Kaspar, 4,057,160, Cl. 215-318.000.

Fisher, Walter A., to Griswold Machine & Engineering, Inc. Trench box height adaptor. 4,056,940, Cl. 61-41.00A.

Fisons Limited: *See—*
Appleton, Richard Anthony; and Brown, Kevin, 4,057,641, Cl. 424-283.000.

Fitch, Robert H.: *See—*
Kurtz, Bruce E.; Guptill, Joel P.; and Fitch, Robert H., 4,057,474, Cl. 204-98.000.

Flaschar, Heinz; and Gand, Heinz, to Robert Bosch GmbH. Electromagnetic valve. 4,057,216, Cl. 251-129.000.

Fleer, Ernst Otto: *See—*
Hofmockel, Dieter; Grassme, Ulrich; Seissl, Johannes; and Fleer, Ernst Otto, 4,057,733, Cl. 250-491.000.

Fleischman, Andor A., to Bell & Howell Company. Adjustable focal length optical design. 4,057,329, Cl. 350-222.000.

Fleischmann, Horst, to PFP-Anstalt Fuer Produkt-Entwicklung und

Verwertung. Apparatus for suspending goods for display. 4,057,147, Cl. 211-47.000.
Fleming, George William; and Paul, Alfred N. Personal aid signalling system. 4,057,790, Cl. 340-224.000.
Flex-O-Lators, Inc.: *See*—
Arnold, Harmon W., 4,057,292, Cl. 297-452.000.
Florian, John, to Mobil Oil Corporation. Meat tray. 4,057,651, Cl. 229-2.500.
Flotow, Richard A., to Dana Corporation. Multiple disk clutch stamped adapter ring. 4,057,131, Cl. 192-70.130.
Floyd, Roger M.: *See*—
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,056,913, Cl. 53-27.000.
Fluor Corporation: *See*—
Valdes, A. R., 4,057,403, Cl. 55-31.000.
FMC Corporation: *See*—
Gibbons, Loren Kenneth, 4,057,416, Cl. 71-90.000.
Meadow, Morton; and Berkowitz, Sidney, 4,057,613, Cl. 423-443.000.
Ramsey, Arthur Albert, 4,057,415, Cl. 71-90.000.
Fomenko, Sergei Michael, to Greenwood Mills, Inc. Coherent scanning system for fabric inspection. 4,057,351, Cl. 356-238.000.
Ford, George Alan, to Walker-Neer Manufacturing Co., Inc. Bit packer for dual tube drilling. 4,057,118, Cl. 175-215.000.
Ford Motor Company: *See*—
Allison, William D., 4,057,355, Cl. 403-2.000.
Fork, Kurt; Lambrecht, Dietrich; Waldmann, Hermann; and Hofmann, Helmut, to Kraftwerk Union Aktiengesellschaft. Durability or service-life monitoring device for a turbogenerator shaft. 4,057,714, Cl. 264-494.000.
Foster, Daniel S. Boat propulsion with surface-running propeller drive. 4,057,027, Cl. 115-39.000.
Foster, David J., to General Motors Corporation. Brake system. 4,057,301, Cl. 303-114.000.
Foster Wheeler Energy Corporation: *See*—
Bromwich, Robert Alan Charles, 4,056,972, Cl. 73-620.000.
Fragale, Eleanor M. Clothes hamper. 4,057,309, Cl. 312-290.000.
Francis, David J.: *See*—
Slama, Jerry L.; Francis, David J.; and Shepherd, Gordon R., 4,057,185, Cl. 226-1.000.
Frank, Lee Fitzpatrick, to Eastman Kodak Company. Compact viewer. 4,057,337, Cl. 353-26.00R.
Franz, William F.: *See*—
Cole, Edward L.; Hess, Howard V.; and Franz, William F., 4,057,399, Cl. 44-6.000.
Fratzke, Lawrence F.: *See*—
Crumrine, Albert W.; and Fratzke, Lawrence F., 4,057,502, Cl. 210-440.000.
Fraunberger, Martin J.: *See*—
Albrecht, Robert J.; and Fraunberger, Martin J., 4,057,078, Cl. 137-625.200.
Friedman, Ronald L.; and Lewis, Roger N., to Argus Chemical Corporation. Polymerization method and t-alkyl peresters of t-hydroperoxides for use therein. 4,057,567, Cl. 260-453.0RZ.
Friedrich Wilhelm Schwing GmbH: *See*—
Schwing, Friedrich, 4,057,373, Cl. 417-519.000.
Fuchs, Peter: *See*—
Pietzsch, Ludwig; Huhne, Gerd; Overlach, Knud; and Fuchs, Peter, 4,057,792, Cl. 340-267.00C.
Fuji Electrochemical Co., Ltd.: *See*—
Kobayashi, Seihin; Torii, Michihiro; and Kobayashi, Hiroaki, 4,057,606, Cl. 264-24.000.
Fuji Photo Film Co., Ltd.: *See*—
Itagaki, Sadayoshi, 4,057,496, Cl. 210-65.000.
Sato, Akira; Ogawa, Akira; Hinata, Masanao; and Takei, Haruo, 4,057,430, Cl. 96-100.00R.
Fuji Shiko Kabushiki Kaisha: *See*—
Asano, Shinzo, 4,057,013, Cl. 101-212.000.
Fujimoto, Sakae, to Ricoh Co., Ltd. Sheet feed termination detector. 4,057,243, Cl. 271-256.000.
Fujinaga, Masao: *See*—
Ono, Tetsuhiro; Aramaki, Minoru; Mizuno, Tamotsu; and Fujinaga, Masao, 4,057,614, Cl. 423-490.000.
Fujita, Hiroshi: *See*—
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,057,629, Cl. 424-177.000.
Fujitsu Limited: *See*—
Kaneda, Saburo; and Tokura, Koichi, 4,057,850, Cl. 364-200.000.
Fujiwhara, Mitsuto; Kojima, Tamotsu; and Matsuo, Syunji, to Konishiroku Photo Industry Co., Ltd. Acylacetanilide coupler with heterocyclic diacyl amino coupling-off group. 4,057,432, Cl. 96-56.200.
Fukata, Yasuo: *See*—
Nakagome, Yukio; Teramura, Hiroichi; Fukata, Yasuo; and Yamasaki, Yasuhiro, 4,057,834, Cl. 358-133.000.
Fukui, Takashi; and Ikeda, Takami, to Sumitomo Metal Industries Limited. Process for vacuum decarburization of steel. 4,057,421, Cl. 75-60.000.
Fukumura, Kagenori: *See*—
Sakai, Toshimitsu; Fukumura, Kagenori; and Saito, Tadashi, 4,056,991, Cl. 74-863.000.
Fukuoka, Itsuo: *See*—
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,057,779, Cl. 340-3.00C.
Fun Things, Inc.: *See*—
Csoka, Frank S., 4,057,253, Cl. 273-131.0BA.
Furlette, James L.; and Stadler, Donald A. Torque limiting coupling. 4,056,953, Cl. 64-30.00D.
Furnadjiev, Vassil Lazarov; and Samardjiev, Boris Krestanov, to CS na BSFS. Apparatus for analyzing movements of an animate or inanimate object. 4,057,806, Cl. 346-33.00R.
Furniss, William E.; Vancsa, George I.; and Onufer, Joseph R., to Westinghouse Electric Corporation. Sequence of events recorder and system for transmitting sequence data from a remote station to a master station. 4,057,785, Cl. 340-163.000.
Furst, Andor; Gutzwiller, Jurg; Muller, Marcel; Wiechert, Rudolf; Eder, Ulrich; and Neef, Gunter, to Hoffmann-La Roche Inc. D-Homo-19-norsteroids. 4,057,561, Cl. 260-345.90S.
Furuno Electric Company, Limited: *See*—
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,057,779, Cl. 340-3.00C.
G. D. Searle & Co.: *See*—
Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, 4,057,549, Cl. 260-293.540.
Dryden, Hugh L., Jr.; Scaros, Mike G.; and Telinski, Thomas J., 4,057,542, Cl. 260-239.55C.
Dryden, Hugh L., Jr.; and Markos, Charles S., 4,057,543, Cl. 260-239.570.
Jaszczak, Ronald J., 4,057,726, Cl. 250-363.00S.
Meyer, Rolf; and Burgess, John E., 4,057,148, Cl. 211-74.000.
Muehllehner, Gerd; and Buchin, Michael P., 4,057,727, Cl. 250-363.00S.
G. D. Societa per Azioni: *See*—
Seragnoli, Enzo, 4,056,915, Cl. 53-59.00R.
Seragnoli, Enzo, 4,056,916, Cl. 53-59.00R.
Seragnoli, Enzo, 4,056,917, Cl. 53-59.00R.
GAF Corporation: *See*—
Hort, Eugene V.; and Williams, Earl P., 4,057,533, Cl. 260-67.500.
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., to Gulf & Western Manufacturing Company. Heavy duty resilient coupling assembly. 4,057,304, Cl. 308-237.00A.
Galinke, Joachim: *See*—
Hase, Brigitte; Hase, Christian; Galinke, Joachim; and Wegemund, Bernd, 4,057,622, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,057,623, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,057,624, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,057,625, Cl. 424-78.000.
Gallagher, Don R.: *See*—
Jones, Bernard H.; Cox, Daniel; and Gallagher, Don R., 4,057,195, Cl. 242-18.00G.
Gallagher, Robert C., to Westinghouse Electric Corporation. Dual gate MNOS transistor. 4,057,820, Cl. 357-23.000.
Gand, Heinz: *See*—
Flaschar, Heinz; and Gand, Heinz, 4,057,216, Cl. 251-129.000.
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, to Merck Patent Gesellschaft mit beschrankter Haftung. Araliphatic dihalogen compounds and process for their preparation. 4,057,647, Cl. 424-340.000.
Ganz, Frederick M., to Grumman Aerospace Corporation. Multi-PRF signal processor system. 4,057,800, Cl. 343-8.000.
Gardner, James Dennis; and Glasscock, Robert William, to Firestone Tire & Rubber Company, The. Pneumatic tire. 4,057,091, Cl. 152-353.00R.
Garnett, John Lyndon; and Rock, John Denis. Curable pre-polymer compositions, method of making and method of coating articles therewith. 4,057,657, Cl. 427-44.000.
Garrett, Donald E. Process for in situ conversion of coal or the like into oil and gas. 4,057,293, Cl. 299-2.000.
Garrett, Luther J. Carrying rack for trucks. 4,057,281, Cl. 296-3.000.
Garver, Wayne E.: *See*—
Fillmore, William E.; Garver, Wayne E.; Mumford, George V.; and Price, James H., 4,057,159, Cl. 215-222.000.
Gaskell, Alfred J.; and Charnley, Ralph L., to Pako Corporation. Automatic replenisher system for a photographic processor. 4,057,818, Cl. 354-298.000.
Gaspar, Phyllis L. Child's play seat apparatus. 4,057,244, Cl. 272-1.00A.
Gassmann, Horst-Detlef, to Hilti Aktiengesellschaft. Damping chamber for an explosive charge-driven fastening element setting gun. 4,056,935, Cl. 60-632.000.
Gatewood, Sidney Ulane, to Borg-Warner Corporation. Automatic clutch wear adjuster. 4,057,134, Cl. 192-111.00A.
Gau, Leonard P., to Chrysler Corporation. Swirler for a fluid flowmeter and method of making same. 4,056,977, Cl. 73-272.00R.
Gay, Walter A., to Olin Corporation. Process for making pentachloronitrobenzene. 4,057,590, Cl. 260-646.000.
Gedenk, Rudolf: *See*—
Pusch, Gunter; and Gedenk, Rudolf, 4,057,107, Cl. 166-260.000.
Geffers, Hans: *See*—
Bohnsack, Gerhard; Geffers, Hans; Kallfass, Herbert; and Radt, Walter, 4,057,511, Cl. 252-389.00A.
Geiszler, Adolph Oscar: *See*—
Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, 4,057,582, Cl. 260-574.000.
General Dynamics Corporation: *See*—
Krikorian, Esther; and Crisp, Michael J., 4,057,476, Cl. 204-192.00P.
General Electric Company: *See*—
Bond, James A.; Eckard, Spurgeon E.; and Schnacke, Arthur W., 4,056,946, Cl. 62-121.000.

Cooper, Glenn Dale; and Schraga, Irwin, 4,057,599, Cl. 260-874.000.
Hildebrand, George Lee; Sleeper, Thomas Till; Healey, William Allen; Hall, Stuart Jeffery; and Pfuntner, Richard A., 4,056,976, Cl. 73-231.00M.
Preston, John M., 4,057,663, Cl. 427-307.000.
Roberts, John A., 4,056,967, Cl. 73-1.00G.
Sobolewski, Valentine S., 4,057,219, Cl. 254-175.000.
Thompson, John Robert; Rowland, Trevor Cartwright; Proebstle, Richard Alan; Rosicky, Edward; and Snyder, Thoma Mees van't Hoff, 4,057,466, Cl. 176-38.000.

General Motors Corporation: *See*—
Baber, James R.; and Dershem, Ronald J., 4,057,080, Cl. 138-44.000.
Foster, David J., 4,057,301, Cl. 303-114.000.
Roethlisberger, Jerry M., 4,057,120, Cl. 180-44.00R.

General Tire & Rubber Company, The: *See*—
Tracy, Frank R., 4,057,092, Cl. 152-379.100.

Genova, Arthur F.; and Lennon, Thomas J., to GTE Sylvania Incorporated. Communication receiving apparatus. 4,057,759, Cl. 325-320.000.

Genshaw, Marvin Alden, to Miles Laboratories, Inc. Test device and method for determining blood hemoglobin. 4,057,394, Cl. 23-230.00B.

Gerhardt, Fred, to Edeco-West, Inc. Rolling machine assembly. 4,056,962, Cl. 72-170.000.

Gerritsen, Gerrit Berend: *See*—
Jacobs, Bernardus Antonius Johannus; van der Wal, Johannes; and Gerritsen, Gerrit Berend, 4,057,831, Cl. 358-128.000.

Geus, Ewald; and Tammi, Vesa, to Alexander Binzel Corporation. Gas shielded arc welding torch. 4,057,704, Cl. 219-75.000.

Giannone, Frank C. Eye treatment apparatus. 4,057,054, Cl. 128-76.500.

Gibbons, Loren Kenneth, to FMC Corporation. 3-Alkylthio-, 3-alkylsulfinyl-, and 3-alkylsulfonylisothiazole derivatives as herbicides. 4,057,416, Cl. 71-90.000.

Gibson, Myron R., to Caterpillar Tractor Co. Rotary engine with variable orifice prechamber. 4,057,036, Cl. 123-8.090.

Gieles, Antonius Cornelis Maria; and Somers, Gerardus Henricus Johannus, to U.S. Philips Corporation. Device for sterilization by transuterine tube coagulation. 4,057,063, Cl. 128-303.170.

Gilliam, Charles David, to New York School of Locksmithing, Inc. Tool for determining safe lock component positions. 4,056,956, Cl. 70-446.000.

Gilliand, Andre Ferdinand Louis; and Looser, Christian, to Alcan Research and Development Limited. Aseptic packing unit and a service unit for providing the packing unit with sterile utilities. 4,056,921, Cl. 53-167.000.

Girres, Gerard E., to Raymond Lee Organization Inc., The, a part interest. Apparatus for playing a horse-racing game. 4,057,254, Cl. 273-134.0CH.

Gitlin, Richard Dennis; and Thompson, John Stewart, to Bell Telephone Laboratories, Incorporated. Recursive-like adaptive echo canceller. 4,057,696, Cl. 179-170.200.

Giuffrida, Anthony J., to Ionics, Incorporated. Electrodialysis apparatus and process for ion modification. 4,057,483, Cl. 204-301.000.

Gladden, Kenneth D.: *See*—
Hays, Raymond H.; and Gladden, Kenneth D., 4,057,230, Cl. 266-117.000.

Glass, Dwight W., to Keystone Consolidated Industries, Inc. Ignition lock. 4,056,955, Cl. 70-422.000.

Glasscock, Robert William: *See*—
Gardner, James Dennis; and Glasscock, Robert William, 4,057,091, Cl. 152-353.00R.

Gnabs, Christian: *See*—
Bachmann, Wilfried; Gnabs, Christian; Janecka, Kurt; Mundlos, Eberhard; Papenfuhs, Theodor; and Waese, Gerhard, 4,057,576, Cl. 260-525.000.

Gobin, Renee: *See*—
Bardy, Andre; Beydon, Jacqueline; Gobin, Renee; and Hegesippe, Michel, 4,057,615, Cl. 424-1.000.

Goettler, Lloyd Arnold; and Lambright, Arthur James, to Monsanto Company. Hose reinforced with discontinuous fibers oriented in the radial direction. 4,057,610, Cl. 264-108.000.

Goldstein, Arthur M.: *See*—
Costanza, John R.; DeMartino, Ronald N.; and Goldstein, Arthur M., 4,057,509, Cl. 252-316.000.

Gonnam, Russell W.: *See*—
Hinman, Walter L., Jr.; and Gonnam, Russell W., 4,057,841, Cl. 361-64.000.

Gontero, Piero, to Ing. C. Olivetti & C., S.p.A. Electrostatic copying machine with multi-frame drum assembly. 4,057,343, Cl. 355-16.000.

Goodfellow, Anthony Gerald, to Dunlop Limited. Pneumatic tire manufacture. 4,057,446, Cl. 156-123.00R.

Goodfellow, Anthony Gerald: *See*—
Holroyd, Eric; Goodfellow, Anthony Gerald; and McGlashen, James Neil, 4,057,447, Cl. 156-125.000.

Goodhouse, Carl J., to Robertshaw Controls Company. Presettable defrost timer. 4,056,948, Cl. 62-155.000.

Goodyear Tire & Rubber Company, The: *See*—
Brinkley, Max D., 4,057,445, Cl. 156-121.000.
Caravito, V. A., 4,057,302, Cl. 305-19.000.
Creekmore, Mark D.; and Panning, Henry F., 4,057,672, Cl. 428-220.000.
Finelli, Anthony F.; Jasani, Shirish; and Williams, Columbus, Jr., 4,057,431, Cl. 96-115.00R.
Smith, Michael W.; and Houck, Stanley J., 4,057,454, Cl. 156-401.000.

Goralski, Christian T.: *See*—
Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,057,517, Cl. 260-22.00R.

Gorbaty, Martin L., to Exxon Research & Engineering Co. Process for homogeneously polymerized high unsaturation C4–C10 isoolefin conjugated diene copolymers. 4,057,681, Cl. 526-185.000.

Gordon, Donald W. Athlete's landing pit standard protector. 4,057,245, Cl. 272-101.000.

Gorodetsky, Sergei Sergeevich: *See*—
Bataev, Mikhail Kirillovich; Veits, Isaak Efimovich; Gorodetsky, Sergei Sergeevich; Macheret, Lev Ilich; Kuznetsov, Lev Alexeevich; Tjurin, Albert Vasilievich; and Yaunzem, Jury Eduardovich, 4,057,453, Cl. 156-390.000.

Goryannikov, Vladimir Mikhailovich: *See*—
Kudryavtsev, Alexandr Alexandrovich; Firsov, Vitaly Mikhailovich; Solinov, Evgeny Fedorovich; Symon, Mark Klavdievich; Litvinov, Pavel Ivanovich; Veresov, Albert Pavlovich; Rybakov, Ivan Alexandrovich; Trishin, Viktor Timofeevich; Goryannikov, Vladimir Mikhailovich; Savin, Vyacheslav Pavlovich; and Kashkarov, Igor Georgievich, 4,057,409, Cl. 65-154.000.

Gossett, Rodger L., to American Medical Products Company. Magnesium sulfate anhydrous hot pack having an inner bag provided with a perforated seal. 4,057,047, Cl. 126-263.000.

Goto, Hirokazu; and Nagashima, Kunio, to Nippon Electric Company, Ltd. Switching network with crosstalk elimination capability. 4,057,691, Cl. 179-18.0GF.

Gotzen, Heinrich, to Heinrich Gotzen Maschinenbau. Multi-shell grab bucket. 4,057,278, Cl. 294-88.000.

Grace, Bud W. Towing apparatus. 4,057,265, Cl. 280-468.000.

Grain Systems, Inc.: *See*—
Taylor, Quentin, 4,057,112, Cl. 172-166.000.

Grassme, Ulrich: *See*—
Hofmockel, Dieter; Grassme, Ulrich; Seissl, Johannes; and Fleer, Ernst Otto, 4,057,733, Cl. 250-491.000.

Graver, Clair Warren; Carwheel, Clarence Edward; and Bunczk, Charles Joseph, to Pennwalt Corporation. Concentrates for imparting temporary soil release resins in fabrics during laundering. 4,057,503, Cl. 252-8.700.

Grebe, Edward Andrew, to Wisconsin Bridge & Iron Co. Apparatus for routing logs. 4,057,138, Cl. 198-480.000.

Greeley, Ashford C.; and Daniel, Sam M., to Motorola Inc. Minimum miss distance vector measuring system. 4,057,708, Cl. 235-413.000.

Greendale, John H., to United States of America, Army. Adjustable helmet suspension system. 4,056,852, Cl. 2-417.000.

Greenwood Mills, Inc.: *See*—
Fomenko, Sergei Michael, 4,057,351, Cl. 356-238.000.

Griffith, James R.; and O'Rear, Jacques G., to United States of America, Navy. Bisorthodinitriles. 4,057,569, Cl. 260-465.00E.

Griswold, James L. Trench shoring assembly with rigid main frame support. 4,056,938, Cl. 61-41.00A.

Griswold Machine & Engineering, Inc.: *See*—
Fisher, Walter A., 4,056,940, Cl. 61-41.00A.

Gronen, Willy: *See*—
Feess, Erich; and Gronen, Willy, 4,057,389, Cl. 8-71.000.

Grooman, Edward D., to Chevron Research Company. Ballistic nylon fabric turbine governor housing shielding means. 4,057,359, Cl. 415-9.000.

Gross, Benjamin; and Owen, Hartley, to Mobil Oil Corporation. System for regenerating fluidizable catalyst particles. 4,057,397, Cl. 23-288.00B.

Gross, Donald Ralph; Schaefer, Nick Lewis; Russell, John Raymond; and Johnson, Clifford Ray, to Trus Joist Corporation. Apparatus for forming serrations in opposed edges of wooden panels for use in I-beams. 4,057,088, Cl. 144-91.000.

Gross, Heiko, to Siempelkamp Giesserei KG. Pressure vessel for nuclear reactor. 4,057,162, Cl. 220-3.000.

Gross, James R., to Dow Chemical Company, The. Absorbent articles made from carboxylic synthetic polyelectrolytes having copolymerized N-substituted acrylamide crosslinker. 4,057,521, Cl. 260-29.6HN.

Grossfield, Karl, to National Research Development Corporation. Calling aids. 4,057,794, Cl. 340-311.000.

Grudzinskas, Charles Vincent; and Weiss, Martin Joseph, to American Cyanamid Company. Novel 11-deoxy-substituted prostaglandins of the E and F series. 4,057,571, Cl. 560-121.000.

Grumman Aerospace Corporation: *See*—
Ganz, Frederick M., 4,057,800, Cl. 343-8.000.

Grunbacher, Martin; and Johannsen, Hans Werner, to Minox GmbH, Firma. Sub-miniature camera construction. 4,057,814, Cl. 354-204.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Lee, Man Shek, 4,057,766, Cl. 330-107.000.

GTE Sylvania Incorporated: *See*—
Genova, Arthur F.; and Lennon, Thomas J., 4,057,759, Cl. 325-320.000.
Seidel, Heinz H., 4,056,872, Cl. 407-114.000.
Wolfe, Robert Wade; and Messier, Russell Francis, 4,057,508, Cl. 252-301.40H.

Guarnere, Joseph V., to TIW Industries, Inc. Wall support mechanism for adjusting the vertical orientation and height of a wall member. 4,056,903, Cl. 52-122.000.

Guillot, Jack, to Bennes Marrel, Zone Industrielle. Rotary heat exchanger, in particular for a gas turbine. 4,057,102, Cl. 165-8.000.

Gulf Oil Corporation: *See*—
Sinclair, Richard G., 4,057,537, Cl. 260-78.30R.

Gulf Research & Development Company: *See*—
Budzak, Paul A.; and Clinton, Russell M., III, 4,057,393, Cl. 23-230.0PC.
Innes, Robert A.; and Perrotta, Anthony J., 4,057,570, Cl. 260-465.300.
Montagna, Angelo Anthony; Somers, Allen Evarts; Peake, Stephen Luther; and Chun, Sun Woong, 4,057,488, Cl. 208-89.000.
Montagna, Angelo Anthony; Somers, Allen Evarts; and Sebulsky, Raynor Tyler, 4,057,489, Cl. 208-89.000.
Rhodes, Donald F., 4,057,071, Cl. 137-1.000.
Wynne, Francis Edmund, Jr., 4,057,490, Cl. 208-127.000.
Gulf & Western Manufacturing Company: *See*—
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,057,304, Cl. 308-237.00A.
Gunjian, Armen G. Grill cleaning brush. 4,056,863, Cl. 15-160.000.
Guptill, Joel P.: *See*—
Kurtz, Bruce E.; Guptill, Joel P.; and Fitch, Robert H., 4,057,474, Cl. 204-98.000.
Gustafson Mfg. Co.: *See*—
Olander, Harvey F., 4,057,172, Cl. 221-10.000.
Gustav F. Gerdts KG: *See*—
Zimmermann, Heino, 4,056,978, Cl. 73-304.00R.
Guth, Hans: *See*—
Muschelknautz, Edgar; Burkholz, Armin; Wieschen, Hermann; Guth, Hans; and Richter, Wolfgang, 4,057,075, Cl. 137-171.000.
Gutsche, Klaus; Kohlmann, Friedrich-Wilhelm; and Scharwachter, Peter, to Nordmark-Werke GmbH Hamburg. Imidazole derivatives. 4,057,545, Cl. 542-428.000.
Gutzwiller, Jurg: *See*—
Furst, Andor; Gutzwiller, Jurg; Muller, Marcel; Wiechert, Rudolf; Eder, Ulrich; and Neef, Gunter, 4,057,561, Cl. 260-345.90S.
H. H. Robertson Company: *See*—
Summers, John E.; and Hadley, John F., 4,057,519, Cl. 260-2.5AK.
Haas, Georges; and Rossi, Alberto, to Ciba-Geigy Corporation. New hydroaromatic compounds. 4,057,573, Cl. 560-52.000.
Habermeier, Jurgen, to Ciba-Geigy Corporation. Halogenated bis-acrylates. 4,057,558, Cl. 548-305.000.
Habu, Teiji; Wada, Tsuneo; Sasaki, Takashi; Itoh, Shigemasa; Ohmura, Takayoshi; Ishii, Hiroki; and Yamaguchi, Hisashi, to Konishiroku Photo Industry Co., Ltd. Method for hardening gelatin. 4,057,538, Cl. 260-117.000.
Hachinohe Smelting Co., Ltd.: *See*—
Kinoshita, Hisahiro, 4,057,423, Cl. 75-109.000.
Hacman, Dionys; and Keutschegger, Adolf, to Balzers Patent- und Beteiligungs-Aktiengesellschaft. Reflection reducing multilayer system on a highly refractive infrared transmitting substrate. 4,057,316, Cl. 350-1.000.
Hadley, John F.: *See*—
Summers, John E.; and Hadley, John F., 4,057,519, Cl. 260-2.5AK.
Hagermo, Kjell Gustaf Roland, to Telefonaktiebolaget L M Ericsson. Connecting device at a bus bar. 4,057,312, Cl. 339-21.00R.
Hahn, Karl Friedrich, to Heye, Hermann. Apparatus for cooling tools of glass-forming machines by evaporation of a cooling liquid. 4,056,949, Cl. 62-373.000.
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Toriya, Jun; Sato, Masato; Shiraga, Ken; and Matsunaga, Setsuo, 4,057,472, Cl. 203-80.000.
Halberstadt, Harry J.; and Rowley, Leroy S., to Lockheed Missiles & Space Company, Inc. Electrochemical cell. 4,057,675, Cl. 429-39.000.
Halcon International, Inc.: *See*—
Chueh, Chun Fei, 4,057,471, Cl. 203-69.000.
Hall, Stuart Jeffery: *See*—
Hildebrand, George Lee; Sleeper, Thomas Till; Healey, William Allen; Hall, Stuart Jeffery; and Pfuntner, Richard A., 4,056,976, Cl. 73-231.00M.
Halliar, William R.; and Stark, Marvin, to Pullman Incorporated. Cam operated hatch cover holddown. 4,057,020, Cl. 105-377.000.
Halopoff, William. Spring retainer for garage door hardware. 4,057,235, Cl. 267-73.000.
Halverson, Gilbert: *See*—
Tucker, Thomas Lee; and Halverson, Gilbert, 4,056,887, Cl. 33-126.600.
Hamamura, Kimio: *See*—
Kijima, Shizumasa; Yamatu, Isao; Hamamura, Kimio; Minami, Norio; Yamagishi, Youji; and Inai, Yuichi, 4,057,568, Cl. 260-462.00R.
Hamano, Eizaburo, to Tokyo Shibaura Electric Company, Ltd. In-line plural beam color cathode ray tube having deflection defocus correcting elements. 4,057,747, Cl. 313-413.000.
Hanabashi, Teruyuki: *See*—
Yamazaki, Shinichiro; and Hanabashi, Teruyuki, 4,057,166, Cl. 220-8.000.
Hanaoka, Tadashi: *See*—
Sugimoto, Keiichi; Nishijima, Koji; Akimoto, Hiroshi; Hanaoka, Tadashi; and Kakeya, Nobuharu, 4,057,544, Cl. 260-239.100.
Hannauer, George: *See*—
Asthana, Abhaya; and Hannauer, George, 4,057,711, Cl. 364-600.000.
Hannon, Martin J.: *See*—
Soehngen, John W.; and Hannon, Martin J., 4,057,607, Cl. 264-28.000.
Hanscom, Genevieve I.: *See*—
Babb, Raymond E., 4,057,352, Cl. 356-178.000.
Hansen, Clarence M.; and Ledebuhr, Richard L., to Dura Corporation. Method and apparatus for feeding articles onto a moving conveyor. 4,057,137, Cl. 198-443.000.
Harada, Tatsuo: *See*—
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Harada, Tetsuya, to Nissan Motor Co., Ltd. Exhaust gas recirculation system. 4,057,043, Cl. 123-119.00A.
Harbert, Donald Duane; and Ferrie, Ronald Gilbert, to RCA Corporation. Received signal selecting system with priority control. 4,057,761, Cl. 328-154.000.
Harder, Arthur J., Jr., to Coach and Car Equipment Corporation. Seat with energy absorbing mounting. 4,057,214, Cl. 248-399.000.
Harrington, Francis E.; and Ho, Robert S., to Sandoz, Inc. Substituted or unsubstituted p-alkanoyl toluenes as male anti-fertility agents. 4,057,646, Cl. 424-331.000.
Harris Corporation: *See*—
Monahan, John F., 4,057,828, Cl. 358-32.000.
Harrison, George C., to Polaroid Corporation. Quench strobe with predetermined quench rate. 4,057,811, Cl. 354-33.000.
Harrison, Marc S.: *See*—
Schwartz, Robert T.; and Harrison, Marc S., 4,057,288, Cl. 297-239.000.
Hart, Courtney: *See*—
Saxena, Arjun N.; and Hart, Courtney, 4,057,460, Cl. 156-643.000.
Hasbro Industries, Inc.: *See*—
Renegar, Charles Gwin; and Colbeck, Frank Edward, 4,057,456, Cl. 156-515.000.
Hase, Brigitte; Hase, Christian; Galinke, Joachim; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Water-in-oil creams with polymeric emulsifiers. 4,057,622, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Cosmetic emulsions containing N-vinylpyrrolidone-alkyl acrylate copolymers. 4,057,623, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Cosmetic emulsions containing acrylamide copolymer. 4,057,624, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Cosmetic emulsions containing N-vinylpyrrolidone/vinyl alkylcarboxylate copolymer. 4,057,625, Cl. 424-78.000.
Hase, Christian: *See*—
Hase, Brigitte; Hase, Christian; Galinke, Joachim; and Wegemund, Bernd, 4,057,622, Cl. 424-78.000.
Hasebe, Nobuyuki: *See*—
Takamizawa, Minoru; Okada, Humio; Hasebe, Nobuyuki; and Toida, Hiromi, 4,057,596, Cl. 260-825.000.
Hashimoto, Akihiro; Hayashi, Shigeo; Yamamoto, Sadao; and Chujo, Hitoshi, to Showa Denko Kabushiki Kaisha; and Misawa Homes Institute of Research and Development. Process of continuous manufacture of light-weight foamed concrete. 4,057,608, Cl. 264-42.000.
Hashimoto, Seiya: *See*—
Moriyama, Shigeo; Harada, Tatsuo; Kawamura, Yoshio; Hashimoto, Seiya; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; and Hosaka, Sumio, 4,057,347, Cl. 355-67.000.
Hata, Yoshitaka, to Nissan Motor Co., Ltd. Multi-cylinder internal combustion engine and method of operation thereof. 4,056,931, Cl. 60-274.000.
Hatano, Mitsuru, to Toyo Kogyo Co., Ltd. Automatic multi-speed transmission and overdrive combination. 4,056,990, Cl. 74-781.00R.
Hatori, Kunitake; Ozaki, Toshihiko; and Kondo, Ryohei, to Sankyo Electric Company Limited. Article storage devices with article releasers for use in vending machines. 4,057,171, Cl. 221-6.000.
Hattori, Kazuhide: *See*—
Yazaki, Takao; and Hattori, Kazuhide, 4,057,385, Cl. 425-466.000.
Hattori, Takeshi; and Adachi, Fumiyuki, to Nippon Telegraph and Telephone Public Corporation. Mobile diversity radio communication system. 4,057,758, Cl. 325-56.000.
Hattori, Torao; and Maezono, Masakazu, to Honda Giken Kogyo Kabushiki Kaisha. Shift control for high and low speed clutches of motorcars. 4,057,132, Cl. 192-87.190.
Hayakawa, Shigeru: *See*—
Kawashima, Syunichiro; Nishida, Masamitsu; Matsuo, Yoshihiro; Ouchi, Hiromu; and Hayakawa, Shigeru, 4,057,324, Cl. 350-150.000.
Hayashi, Kenji, to Hitachi, Ltd. Address translation system. 4,057,848, Cl. 364-200.000.
Hayashi, Shigeo: *See*—
Hashimoto, Akihiro; Hayashi, Shigeo; Yamamoto, Sadao; and Chujo, Hitoshi, 4,057,608, Cl. 264-42.000.
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Hays, Raymond H.; and Gladden, Kenneth D., to Caterpillar Tractor Co. Die quench machine and method. 4,057,230, Cl. 266-117.000.
Hazen, Wayne W.: *See*—
Jennings, Larry D.; and Hazen, Wayne W., 4,057,611, Cl. 423-127.000.
Healey, William Allen: *See*—
Hildebrand, George Lee; Sleeper, Thomas Till; Healey, William Allen; Hall, Stuart Jeffery; and Pfuntner, Richard A., 4,056,976, Cl. 73-231.00M.
Healy, James W. Vapor control. 4,057,086, Cl. 141-206.000.
Heather, James B.: *See*—
Sih, Charles J.; and Heather, James B., 4,057,851, Cl. 560-121.000.
Hedger, Denyer Edward, to Vero Electronics Limited. Wiring pens. 4,057,186, Cl. 226-127.000.

Hedstrom Company: *See*—
Ziegler, William H., Jr., 4,056,902, Cl. 52-73.000.
Hegesippe, Michel: *See*—
Bardy, Andre; Beydon, Jacqueline; Gobin, Renee; and Hegesippe, Michel, 4,057,615, Cl. 424-1.000.
Heidemann, Rolf, to Windmoller & Holscher. Printing press convertible from intaglio to flexographic printing and vice versa. 4,057,012, Cl. 101-153.000.
Heinrich Gotzen Maschinenbau: *See*—
Gotzen, Heinrich, 4,057,278, Cl. 294-88.000.
Heiser, Elmer F. Press system or the like. 4,056,965, Cl. 72-351.000.
Helber, Karl: *See*—
Rentschler, Waldemar T.; Starp, Franz W. R.; and Helber, Karl, 4,057,812, Cl. 354-51.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Hase, Brigitte; Hase, Christian; Galinke, Joachim; and Wegemund, Bernd, 4,057,622, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,057,623, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,057,624, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,057,625, Cl. 424-78.000.
Hennells, Ransom J. Self adjusting energy absorber employing conical control sleeve. 4,057,129, Cl. 188-285.000.
Hennells, Ransom J. Energy absorber. 4,057,236, Cl. 267-116.000.
Henningsen, Tom; and Conroy, John J., to Westinghouse Electric Corporation. Acousto-optic Q-switch. 4,057,770, Cl. 331-94.50Q.
Herforth, Dieter: *See*—
Doelves, Juergen; and Herforth, Dieter, 4,057,838, Cl. 358-299.000.
Herpich, William A.: *See*—
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Herrmann, Franz-Josef: *See*—
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Hess, Howard V.: *See*—
Cole, Edward L.; Hess, Howard V.; and Franz, William F., 4,057,399, Cl. 44-6.000.
Heuer, Dale A.; Roemer, John F.; and Sheehan, Michael J., to International Business Machines Corporation. Read only memory. 4,057,787, Cl. 365-104.000.
Hewitt, John Stringer. Measurement of slurry consistencies. 4,057,729, Cl. 250-390.000.
Heye, Hermann: *See*—
Hahn, Karl Friedrich, 4,056,949, Cl. 62-373.000.
Schaar, Lothar, 4,057,412, Cl. 65-229.000.
Hiatt, Carl C.; and Larson, Nils F., to Hiatt-Larson Corporation. Structural building element. 4,056,910, Cl. 52-600.000.
Hiatt-Larson Corporation: *See*—
Hiatt, Carl C.; and Larson, Nils F., 4,056,910, Cl. 52-600.000.
Hieke, Eduard, to Siemens Aktiengesellschaft. Method and apparatus for the generation of distortion-free images with electron microscope. 4,057,722, Cl. 250-311.000.
Higuchi, Takeru; and Hussain, Anwar, to Alza Corporation. Ocular therapeutic system with selected membranes for administering ophthalmic drug. 4,057,619, Cl. 424-14.000.
Hikosaka, Takashi: *See*—
Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitu, 4,057,339, Cl. 355-3.00R.
Hildebrand, George Lee; Sleeper, Thomas Till; Healey, William Allen; Hall, Stuart Jeffery; and Pfuntner, Richard A., to General Electric Company. Mass rate of flow meter. 4,056,976, Cl. 73-231.00M.
Hill, Christopher Rowland, to National Research Development Corporation. Apparatus for and methods of pulse-echo examination. 4,057,049, Cl. 128-2.00V.
Hill, David Taylor, to SmithKline Corporation. Antiarthritic compositions comprising bis-coordinated gold(1+) salts and methods of producing antiarthritic activity. 4,057,630, Cl. 424-204.000.
Hilti Aktiengesellschaft: *See*—
Gassmann, Horst-Detlef, 4,056,935, Cl. 60-632.000.
Hinata, Masanao: *See*—
Sato, Akira; Ogawa, Akira; Hinata, Masanao; and Takei, Haruo, 4,057,430, Cl. 96-100.00R.
Hinman, Walter L., Jr.; and Gonnam, Russell W., to Westinghouse Electric Corporation. Unsupervised trip keying for phase comparison relaying apparatus. 4,057,841, Cl. 361-64.000.
Hirano, Kimitoshi: *See*—
Shiga, Michio; Hirano, Kimitoshi; and Matsushita, Matsuo, 4,057,504, Cl. 252-33.000.
Hirata, Noritsugu: *See*—
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Hirota, Kiwami: *See*—
Yamazaki, Isamu; Toyama, Yoichi; Hirota, Kiwami; and Takeuchi, Hisashi, 4,057,680, Cl. 526-142.000.
Hirota, Yoshinari. Flexible sheet fixing device. 4,057,095, Cl. 160-392.000.
Hirsch, Hans-Jurgen: *See*—
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Hirsch, John L., to Curt G. Joa, Inc. Diaper packer. 4,056,919, Cl. 53-124.00D.
Hitachi, Ltd.: *See*—
Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; Yoda, Haruo; and Kameyama, Masayoshi, 4,057,845, Cl. 364-200.000.
Hayashi, Kenji, 4,057,848, Cl. 364-200.000.
Maeda, Kunihiro; Imahasi, Hiromichi; and Kikuchi, Matsunosuke, 4,057,458, Cl. 156-603.000.
Moriyama, Shigeo; Harada, Tatsuo; Kawamura, Yoshio; Hashimoto, Seiya; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; and Hosaka, Sumio, 4,057,347, Cl. 355-67.000.
Narita, Kazutoyo; Sakaue, Tadashi; and Niino, Yuzi, 4,057,825, Cl. 357-81.000.
Ohno, Toru, 4,057,695, Cl. 179-170.00R.
Yamamoto, Hajime; Kano, Tsuyoshi; and Nakano, Masaki, 4,057,507, Cl. 252-301.40S.
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Lee, George, 4,057,450, Cl. 156-213.000.
Ho, Robert S.: *See*—
Harrington, Francis E.; and Ho, Robert S., 4,057,646, Cl. 424-331.000.
Hobbs, Howard Frederick, to Variable Kinetic Drives, Ltd. Torque converters. 4,056,986, Cl. 74-688.000.
HOBEG Hochtemperaturreaktor-Brennelement, GmbH: *See*—
Huschka, Hans; and Herrmann, Franz-Josef, 4,057,514, Cl. 252-510.000.
Hoechst Aktiengesellschaft: *See*—
Bachmann, Wilfried; Gnabs, Christian; Janecka, Kurt; Mundlos, Eberhard; Papenfuhs, Theodor; and Waese, Gerhard, 4,057,576, Cl. 260-525.000.
Bestmann, Hans Jurgen; Stransky, Werner Theo; and Vostrowsky, Otto, 4,057,593, Cl. 260-682.000.
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Pistorius, Rudolf, 4,057,586, Cl. 260-613.00D.
Winkelmann, Erhardt; Sinharay, Akhileswer; and Raether, Wolfgang, 4,057,634, Cl. 424-250.000.
Hofer, Johann: *See*—
Schmidt, Dietrich; Huber, Karl Erwin; and Hofer, Johann, 4,057,395, Cl. 23-230.00R.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Eue, Ludwig, to Bayer Aktiengesellschaft. Sulfonylmethylamino-substituted benzoic acids and herbicidal method therewith. 4,057,418, Cl. 71-103.000.
Hoffmann, Georges. Mechanism for parallel connection of infinitely-adjustable looping gearings. 4,056,987, Cl. 74-689.000.
Hoffmann-La Roche Inc.: *See*—
Berger, Julius; Reichelt, Karen Emalyn; and Schuep, Willy, 4,057,553, Cl. 260-295.00A.
Furst, Andor; Gutzwiller, Jurg; Muller, Marcel; Wiechert, Rudolf; Eder, Ulrich; and Neef, Gunter, 4,057,561, Cl. 260-345.90S.
Hofmann, Helmut: *See*—
Fork, Kurt; Lambrecht, Dietrich; Waldmann, Hermann; and Hofmann, Helmut, 4,057,714, Cl. 264-494.000.
Hofmockel, Dieter; Grassme, Ulrich; Seissl, Johannes; and Fleer, Ernst Otto, to Siemens Aktiengesellschaft. Dental X-ray diagnostic installation. 4,057,733, Cl. 250-491.000.
Hogan, John Paul. Space vehicle module. 4,057,207, Cl. 244-159.000.
Holladay, James Eugene, Jr.; and Spencer, Billie Mike, to Sperry Rand Corporation. Continuous-wave ranging system. 4,057,801, Cl. 343-12.00R.
Holland, James Brooks: *See*—
Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, 4,057,582, Cl. 260-574.000.
Hollymatic Corporation: *See*—
Theis, James V., Jr.; and Meyer, Bruno P., 4,057,360, Cl. 415-25.000.
Holman, Scott L., to Bay City Foundry Company. Lateral adjustment mechanism for a machine anchor. 4,057,209, Cl. 248-13.000.
Holme Communications Systems, Inc.: *See*—
Holme, William Raymond, 4,057,804, Cl. 343-200.000.
Holme, William Raymond, to Holme Communications Systems, Inc. Branched path communications apparatus for routing communications signals. 4,057,804, Cl. 343-200.000.
Holroyd, Eric; Goodfellow, Anthony Gerald; and McGlashen, James Neil, to Dunlop Limited. Manufacture of pneumatic tires. 4,057,447, Cl. 156-125.000.
Holstein & Kappert Aktiengesellschaft: *See*—
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Holt, Ian; and Pincherle, Hugh Andrew, to Rank Organisation Limited, The. Method of manufacturing electro-optical cell. 4,056,881, Cl. 29-592.00R.
Holtschmidt, Ulrich: *See*—
Naumann, Klaus; Lurssen, Klaus; Sasse, Klaus; Holtschmidt, Ulrich; and Schwarzmann, Gunter, 4,057,413, Cl. 71-76.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Honeywell Inc.: *See*—
Shafer, Donald E., 4,057,808, Cl. 346-107.00R.
Hood, Frederick E.; Mitchell, Donald K.; and Uhring, Gary S., to Hood Sailmakers, Inc. Halyard rig for roll-furling mainsail. 4,057,023, Cl. 114-107.000.
Hood Sailmakers, Inc.: *See*—
Hood, Frederick E.; Mitchell, Donald K.; and Uhring, Gary S., 4,057,023, Cl. 114-107.000.
Hoogendijk, Adrianus Huibert, to U.S. Philips Corporation. Apparatus for reading color television signal from a disc-shaped record carrier. 4,057,827, Cl. 358-8.000.
Hoogendoorn, Abraham; van de Grift, Robert Emile Johan; and van

Kessel, Theodorus Jozef, to U.S. Philips Corporation. Analog-digital converter. 4,057,796, Cl. 340-347.0AD.
Hooke, William M.: *See—*
Jassby, Daniel L.; and Hooke, William M., 4,057,462, Cl. 176-5.000.
Hool, Gerhard; and Kundig, Hans, to Ciba-Geigy Corporation. Compositions for the control of microorganisms. 4,057,648, Cl. 424-341.000.
Hopf, Heribert; and Schramm, Siegfried, to Keiper GmbH. Vise. 4,057,239, Cl. 269-170.000.
Hornung, Louis Michael: *See—*
Cockerill, William Clyde; Hornung, Louis Michael; Johnson, Donavon William; and Vrba, Richard Alan, 4,057,846, Cl. 364-200.000.
Hort, Eugene V.; and Williams, Earl P., to GAF Corporation. Process for preparation of quaternized cationic vinyllactam-acrylamide copolymers. 4,057,533, Cl. 260-67.500.
Horvath, William, to Plastic Research Products, Inc. Manually operated spray pump. 4,057,176, Cl. 222-193.000.
Hosaka, Sumio: *See—*
Moriyama, Shigeo; Harada, Tatsuo; Kawamura, Yoshio; Hashimoto, Seiya; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; and Hosaka, Sumio, 4,057,347, Cl. 355-67.000.
Hoshikawa, Katuyuki; Noda, Soji; and Kimura, Akitaka, to Sumitomo Rubber Industries, Ltd. Puncture sealing pneumatic tire. 4,057,090, Cl. 152-347.000.
Hosoe, Masaya, to Machida Shigyo Co., Ltd. Tray-like container and a method of and an apparatus for manufacturing the container. 4,057,380, Cl. 425-324.100.
Hosokawa, Yasuhiro: *See—*
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,057,629, Cl. 424-177.000.
Houck, Stanley J.: *See—*
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Howard, David Robert, to Davy-Loewy Limited. Drive arrangement for the rolls of a rolling mill. 4,056,957, Cl. 72-19.000.
Howard, Robert L.: *See—*
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Hozumi, Yoshio: *See—*
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Hubert, Jean-Claude: *See—*
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Hugelin, Bernard: *See—*
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Hughes Aircraft Company: *See—*
Basil, Richard V., Jr.; Ondrups, Leons; and Shimizu, James K., 4,057,772, Cl. 333-83.00T.
Hughes, Charles C., to R. A. Jones & Co. Inc. Carton erecting apparatus. 4,057,008, Cl. 93-53.0BF.
Hughey, Edward W., Jr. Device for measuring the pitch of propeller blades and the like. 4,056,888, Cl. 33-174.00C.
Huhne, Gerd: *See—*
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Humber, Leslie G.: *See—*
Asselin, Andre A.; Humber, Leslie G.; and Dobson, Thomas A., 4,057,559, Cl. 260-315.000.
Hunt, David A., to Dow Chemical Company, The. Process for repairing concrete structures using pneumatically sprayable cement mortar compositions containing portland cement, mineral aggregate, a styrene-butadiene copolymer latex and water. 4,057,528, Cl. 260-29.70S.
Huschka, Hans; and Herrmann, Franz-Josef, to HOBEG Hochtemperaturreaktor-Brennelement, GmbH. Process for the production of graphite molded articles of high isotropy and high heat conductivity. 4,057,514, Cl. 252-510.000.
Hussain, Anwar: *See—*
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Hutzel, Abraham, to Cullen Photo Service, Inc. Photo-finishing packet with date strips for photographic prints. 4,057,140, Cl. 206-216.000.
Ibis Engineers Limited: *See—*
Everett, Nicholas Wynne, 4,057,179, Cl. 223-73.000.
Idemitsu Kosan Company Limited: *See—*
Kimura, Akio; Seki, Kenji; Ukita, Mamoru; Asahi, Satoshi; and Tagami, Sanae, 4,057,600, Cl. 260-878.00B.
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Ihara Chemical Industry Co., Ltd.: *See—*
Koike, Wataro; Kimoto, Takahiro; and Matsui, Sadayoshi, 4,057,555, Cl. 260-301.000.
Ihle, Josef, to Ungerer geb. Dollinger, Irma. Flying shear for the cross-cutting of metal strips or bands. 4,056,994, Cl. 83-311.000.
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, to Furuno Electric Company, Limited. Ultrasonic detection system. 4,057,779, Cl. 340-3.00C.
Iino, Nobuhiro: *See—*
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Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitu, 4,057,339, Cl. 355-3.00R.
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Davies, Peter Kingsley; Rogers, Leslie Richard; Stansfield, James Frederick; and Topham, Arthur, 4,057,436, Cl. 106-288.00Q.
Inai, Yuichi: *See—*
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Adams, Truman W., 4,057,024, Cl. 114-298.000.
Infratab Corporation: *See—*
Seiter, Charles, 4,057,029, Cl. 116-114.00V.
Ing. C. Olivetti & C., S.p.A.: *See—*
Gontero, Piero, 4,057,343, Cl. 355-16.000.
Innes, Robert A.; and Perrotta, Anthony J., to Gulf Research & Development Company. Process for preparing acrylonitrile. 4,057,570, Cl. 260-465.300.
Inoue, Fumio: *See—*
Ozawa, Masahiro; Inoue, Fumio; Komatsu, Tadaaki; and Matsuoka, Kimiaki, 4,057,591, Cl. 260-653.10R.
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Patel, Jitendra G.; Schora, Frank C.; and Loeding, John W., 4,057,402, Cl. 48-197.00R.
Interatom, Internationale Atomreaktorbau GmbH.: *See—*
Kostrzewa, Siegfried, 4,057,467, Cl. 176-65.000.
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Burkhardt, Paul Johannes; and Poponiak, Michael Robert, 4,057,823, Cl. 357-52.000.
Cockerill, William Clyde; Hornung, Louis Michael; Johnson, Donavon William; and Vrba, Richard Alan, 4,057,846, Cl. 364-200.000.
Ferry, Michel, 4,057,717, Cl. 364-802.000.
Heuer, Dale A.; Roemer, John F.; and Sheehan, Michael J., 4,057,787, Cl. 365-104.000.
Juliusburger, Hans Yohanan; and Wortzman, Donald, 4,057,768, Cl. 331-1.00A.
Spadavecchia, Richard I.; and Struk, James R., 4,057,789, Cl. 365-189.000.
Zdeblick, William Thomas, 4,057,305, Cl. 312-11.000.
International Telephone and Telegraph Corporation: *See—*
Kao, Charles K., 4,057,322, Cl. 350-96.00R.
Shihabi, Marwan S., 4,057,085, Cl. 141-59.000.
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Giuffrida, Anthony J., 4,057,483, Cl. 204-301.000.
Irie, Gen, to Honda Giken Kogyo Kabushiki Kaisha. Safety apparatus for a carburetor. 4,057,603, Cl. 261-70.000.
Isenberg, Gerhard; and Tuzinsky, Wolfgang, to Maschinenfabrik Augsburg-Nurnberg AG. Vacuum pump having a rotor supported in the interior of its casing. 4,057,369, Cl. 417-365.000.
Ishida, Takashi, to Okuma Machinery Works Ltd. Cam machining apparatus. 4,056,900, Cl. 51-33.00W.
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Ishii, Hiroki: *See—*
Habu, Teiji; Wada, Tsuneo; Sasaki, Takashi; Itoh, Shigemasa; Ohmura, Takayoshi; Ishii, Hiroki; and Yamaguchi, Hisashi, 4,057,538, Cl. 260-117.000.
Ishikawa, Kazuo; Hirata, Noritsugu; Takigawa, Tomoshi; and Yamada, Yasutsugu, to Canon Kabushiki Kaisha. Self timer device for motion picture camera. 4,057,334, Cl. 352-175.000.
Ishikawa, Shigemitsu, to Kabushiki Kaisha Angel. Sanitary napkin. 4,057,061, Cl. 128-284.000.
Itagaki, Sadayoshi, to Fuji Photo Film Co., Ltd. Method and device for filtration. 4,057,496, Cl. 210-65.000.
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Bruno, Roberto; Memmi, Massimo; Berardi, Paolo; and Musso, Augusto, 4,057,424, Cl. 75-178.00A.
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Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,057,809, Cl. 354-23.00D.
Ito, Tadashi: *See—*
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Naruse, Kiyoji; and Ito, Tadashi, 4,057,522, Cl. 260-28.5AS.
Itoh, Masayasu: *See—*
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Iwata, Hiroshi, to West Electric Co., Ltd. Exposure control system. 4,057,810, Cl. 354-29.000.
Iyoda, Shozo: *See*—
Ubukata, Susumu; Iyoda, Shozo; and Oda, Kenji, 4,057,200, Cl. 242-107.40A.
Izon Corporation: *See*—
Yevick, George J., 4,057,338, Cl. 355-1.000.
J. C. Penney Company, Inc.: *See*—
Woodring, Cooper Coolidge, 4,057,127, Cl. 188-24.000.
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Bislew, John E., 4,057,269, Cl. 285-158.000.
Jackson, Richard Malcolm Clive: *See*—
Bernardo, Gerald; and Jackson, Richard Malcolm Clive, 4,056,909, Cl. 52-396.000.
Jacobs, Bernardus Antonius Johannus; van der Wal, Johannes; and Gerritsen, Gerrit Berend, to U.S. Philips Corporation. Video record disc manufactured by a process involving chemical or sputter etching. 4,057,831, Cl. 358-128.000.
Jadach, Albert A.: *See*—
Chaivre, Joseph W.; and Jadach, Albert A., 4,056,862, Cl. 10-72.00R.
Jaeger: *See*—
Blanchier, Jean-Claude, 4,057,783, Cl. 340-58.000.
Jagunich, Douglas M.: *See*—
Lowell, William P.; and Jagunich, Douglas M., 4,057,847, Cl. 364-200.000.
Jamison, Eugene M. Method and apparatus for forming cylindrical spacers from metal blanks. 4,056,961, Cl. 72-148.000.
Janecka, Kurt: *See*—
Bachmann, Wilfried; Gnabs, Christian; Janecka, Kurt; Mundlos, Eberhard; Papenfuhs, Theodor; and Waese, Gerhard, 4,057,576, Cl. 260-525.000.
Jansen, Martin B., Jr., to Vetco Offshore Industries, Inc. Fluid controlled pipe connectors. 4,057,267, Cl. 285-18.000.
Janssen, Almuth, heir: *See*—
Richtzenhain, Hermann; and Janssen, Paul, deceased, 4,057,552, Cl. 260-294.900.
Janssen, Paul, deceased: *See*—
Richtzenhain, Hermann; and Janssen, Paul, deceased, 4,057,552, Cl. 260-294.900.
Jansson, Staffan, to AB Svenska Flaktfabriken. Apparatus for removing gas filter. 4,057,406, Cl. 55-385.00R.
Jasani, Shirish: *See*—
Finelli, Anthony F.; Jasani, Shirish; and Williams, Columbus, Jr., 4,057,431, Cl. 96-115.00R.
Jassby, Daniel L.; and Hooke, William M., to United States of America, Energy Research and Development Administration. Radio frequency sustained ion energy. 4,057,462, Cl. 176-5.000.
Jaszczak, Ronald J., to G. D. Searle & Co. Collimator trans-axial tomographic scintillation camera. 4,057,726, Cl. 250-363.00S.
Jeffery, Michael Cedric: *See*—
Ley, Anthony John; Metcalf, Eric; and Jeffery, Michael Cedric, 4,057,756, Cl. 324-77.00B.
Jeffreys, Godfrey Vaughan: *See*—
Davies, Graham Arthur; Jeffreys, Godfrey Vaughan; and Bayley, David Pryce, 4,057,493, Cl. 210-23.00R.
Jeghers, Omer: *See*—
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Scheidler, Herwig, 4,057,670, Cl. 428-189.000.
Jennings, Larry D.; and Hazen, Wayne W., to Southwire Company; National Steel Corporation; and Earth Sciences, Inc. Process for recovering aluminum from alunite. 4,057,611, Cl. 423-127.000.
Jeppson, Morris R. Electrical power generation and distribution system. 4,057,736, Cl. 307-78.000.
Jimenez, Roy: *See*—
Castaneda, Fernando; and Jimenez, Roy, 4,057,146, Cl. 209-75.000.
Joerns Furniture Company: *See*—
Damico, Frank M.; and Nass, Raymond D., 4,057,240, Cl. 269-325.000.
Joffre, Philippe: *See*—
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Johannsen, Hans Werner: *See*—
Grunbacher, Martin; and Johannsen, Hans Werner, 4,057,814, Cl. 354-204.000.
Johannsen, Peter, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic tire for motor vehicles. 4,057,089, Cl. 152-209.00R.
Johnson, Bruce K., to Polaroid Corporation. Anti-flare structure for photographic optical system. 4,057,815, Cl. 354-288.000.
Johnson, Charles H.: *See*—
Borsuk, Alvin; and Johnson, Charles H., 4,057,653, Cl. 426-513.000.
Johnson, Clifford Ray: *See*—
Gross, Donald Ralph; Schaefer, Nick Lewis; Russell, John Raymond; and Johnson, Clifford Ray, 4,057,088, Cl. 144-91.000.
Johnson, Donavon William: *See*—
Cockerill, William Clyde; Hornung, Louis Michael; Johnson, Donavon William; and Vrba, Richard Alan, 4,057,846, Cl. 364-200.000.
Johnson, Lawrence E.; and Conger, William W., IV, to Johnson, Lawrence E. Aerator. 4,057,372, Cl. 417-424.000.
Johnson, Raymond E.; and Ellison, Boris. Current carrier communication system. 4,057,793, Cl. 340-310.00R.
Johnson, Robert M.; Winkowski, Daniel A.; and Stiling, Rodney A., to National Gypsum Company. Block-resistant gypsum board. 4,057,662, Cl. 427-209.000.
Johnson, Robert M.: *See*—
Stiling, Rodney A.; Burkard, Edward A.; and Johnson, Robert M., 4,057,443, Cl. 156-43.000.
Joines, John S. Protective apparatus for mounting tires. 4,057,093, Cl. 157-1.000.
Joly, Pascal A. J.: *See*—
Boudot, Jean E.; and Joly, Pascal A. J., 4,057,435, Cl. 106-47.00Q.
Jones, Bernard H.; Cox, Daniel; and Gallagher, Don R., to Owens-Corning Fiberglas Corporation. Apparatus for packaging strand. 4,057,195, Cl. 242-18.00G.
Jones, Donald J.; and Davis, Guy E., to Westinghouse Electric Corporation. Wide range system for transferring steam generator and turbine operation between computers in a multiple turbine computer control system. 4,057,715, Cl. 364-494.000.
Jones, Howard; and Shen, Tsung-Ying, to Merck & Co., Inc. Acyl cyanoguanidines. 4,057,642, Cl. 424-304.000.
Jones, Howard: *See*—
Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., 4,057,637, Cl. 424-263.000.
Jones, James J., to Texas Instruments Incorporated. Fail safe circuit for vehicle skid control brake system. 4,057,299, Cl. 303-92.000.
Jones, Leon L.: *See*—
Shaw, Graham C.; Lawton, Emil A.; and Jones, Leon L., 4,057,442, Cl. 149-109.400.
Jones, Richard F.; and Ping, Ernest L., to Arachnid, Incorporated. Dart game with apertured target plates resiliently mounted. 4,057,251, Cl. 273-95.00R.
Jones, Richard Warren. Apparatus and method for sampling a liquid. 4,056,982, Cl. 73-421.00B.
Jones, Rufus S., Jr., to Celanese Corporation. Process for preparing wholly aromatic polyamides by mixing solid particulate reactants and polymerizing. 4,057,536, Cl. 260-78.00R.
Jones, Trevor Clifford, to Underground Location Services Limited. Pipeline pigs. 4,057,081, Cl. 138-97.000.
Jones, W. Dale. Rockable against-the-wall type reclining chair. 4,057,289, Cl. 297-259.000.
Jorgensen, Adam A., to Stromberg-Carlson Corporation. All digital delta to PCM converter. 4,057,797, Cl. 340-347.0DD.
Jossel, Franklin: *See*—
Mammino, Joseph; and Jossel, Franklin, 4,057,426, Cl. 96-1.0SD.
Juillard, Yves; and Riner, Victor, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Double-layer weaving loom. 4,057,083, Cl. 139-20.000.
Julius Blum Gesellschaft mbH: *See*—
Rock, Erich; and Mages, Bernhard, 4,057,303, Cl. 308-3.600.
Juliusburger, Hans Yohanan; and Wortzman, Donald, to International Business Machines Corporation. Variable increment phase locked loop circuit. 4,057,768, Cl. 331-1.00A.
Jungesjo, Harald N.: *See*—
Anderson, Marvin R.; and Jungesjo, Harald N., 4,056,901, Cl. 51-165.870.
Junginger, Hans-Georg: *See*—
Peschmann, Kristian; Junginger, Hans-Georg; and Hirsch, Hans-Jurgen, 4,057,728, Cl. 250-374.000.
K.D. Ottica s.n.c.: *See*—
Bottazzini, Franco; and Donati, Laura, 4,056,853, Cl. 2-443.000.
K-Tel International, Inc.: *See*—
Koblick, Jeffrey M., 4,057,261, Cl. 280-11.37H.
Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Volker, Martin; and Muhlhoff, Heinz, 4,057,228, Cl. 366-79.000.
Kabushiki Kaisha Angel: *See*—
Ishikawa, Shigemitsu, 4,057,061, Cl. 128-284.000.
Kabushiki Kaisha Asano Tekkosho: *See*—
Asano, Shinzo, 4,057,013, Cl. 101-212.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Kondo, Kenichi, 4,057,325, Cl. 350-160.0LC.
Nakagawa, Yasuichi; Ikenishi, Masataka; Hozumi, Yoshio; Kushida, Shozo; and Tsukutani, Koichi, 4,057,698, Cl. 200-16.00A.
Kabushiki Kaisha Fuji Tekkosho: *See*—
Matsumoto, Yukimichi, 4,056,918, Cl. 53-118.000.
Kabushiki Kaisha Keihinseiki Seisakusho: *See*—
Sakai, Makoto, 4,057,041, Cl. 123-73.0AD.
Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,057,452, Cl. 156-384.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Nishimura, Izuhiko, 4,057,738, Cl. 307-247.00A.
Otake, Tsutomu, 4,057,739, Cl. 307-270.000.
Kackstaedter, Klaus; and Theidel, Hans, to Bayer Aktiengesellschaft. Process for the whitening of textile fibres of polyesters. 4,057,387, Cl. 8-1.00W.
Kaimann, Walter; Pasternak, Rudolf; and Bauer, Jochen. Apparatus for the gasification under pressure of bituminous coal especially of fine coal in a generator. 4,057,400, Cl. 48-77.000.
Kakeya, Nobuharu: *See*—
Sugimoto, Keiichi; Nishijima, Koji; Akimoto, Hiroshi; Hanaoka, Tadashi; and Kakeya, Nobuharu, 4,057,544, Cl. 260-239.100.
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Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,057,550, Cl. 260-293.550.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,057,551, Cl. 260-293.550.

Kalka, Josef; Waskonig, Walter; and Lueg, Karl, to Chemische Werke Huls Aktiengesellschaft. Process and apparatus for withdrawing a sample from a reaction vessel under pressure. 4,056,981, Cl. 73-421.00B.

Kallfass, Herbert: *See*—
Bohnsack, Gerhard; Geffers, Hans; Kallfass, Herbert; and Radt, Walter, 4,057,511, Cl. 252-389.00A.

Kalnin, Ilmar L., to Celanese Corporation. Process for the production of carbon fiber reinforced magnesium composite articles. 4,056,874, Cl. 75-.50R.

Kameyama, Masayoshi: *See*—
Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; Yoda, Haruo; and Kameyama, Masayoshi, 4,057,845, Cl. 364-200.000.

Kamimura, Toshio, to Teijin Seiki Company Limited. Fail-safe fluid control valve. 4,057,004, Cl. 91-30.000.

Kamyr Aktiebolag: *See*—
Richter, Johan C. F.C., 4,057,461, Cl. 162-19.000.

Kane, Vinayak V.: *See*—
Levine, Seymour; and Kane, Vinayak V., 4,057,547, Cl. 544-184.000.

Kaneda, Saburo; and Tokura, Koichi, to Fujitsu Limited. Processing link control device for a data processing system processing data by executing a main routine and a sub-routine. 4,057,850, Cl. 364-200.000.

Kaneko, Masaharu: *See*—
Imahori, Seiichi; Kaneko, Masaharu; and Kato, Yoshiaki, 4,057,539, Cl. 260-155.000.

Kano, Tsuyoshi: *See*—
Yamamoto, Hajime; Kano, Tsuyoshi; and Nakano, Masaki, 4,057,507, Cl. 252-301.40S.

Kao, Charles K., to International Telephone and Telegraph Corporation. Precision surface optical fibers. 4,057,322, Cl. 350-96.00R.

Kao Soap Co., Ltd.: *See*—
Nakagawa, Yunosuke; Majima, Kanji; and Miyamoto, Sigeyuki, 4,057,505, Cl. 252-96.000.

Kappert, Hermanus Antonius, to U.S. Philips Corporation. Apparatus for reading a disk-shaped record carrier with track jumping for charging motion effects. 4,057,832, Cl. 358-128.000.

Karasawa, Hideyasu, to Tomy Kogyo Co., Inc. Toy bird. 4,056,896, Cl. 46-132.000.

Kardell, Kurt J. Reusable folding container. 4,057,165, Cl. 220-6.000.

Karonite Chemical Co., Ltd.: *See*—
Shiga, Michio; Hirano, Kimitoshi; and Matsushita, Matsuo, 4,057,504, Cl. 252-33.000.

Karpati, Egon: *See*—
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Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,057,551, Cl. 260-293.550.

Karrer, Friedrich; and Farooq, Saleem, to Ciba-Geigy Corporation. Diphenyl ether derivatives. 4,057,587, Cl. 260-613.00R.

Kashioka, Seiji: *See*—
Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; Yoda, Haruo; and Kameyama, Masayoshi, 4,057,845, Cl. 364-200.000.

Kashkarov, Igor Georgievich: *See*—
Kudryavtsev, Alexandr Alexandrovich; Firsov, Vitaly Mikhailovich; Solinov, Evgeny Fedorovich; Symon, Mark Klavdievich; Litvinov, Pavel Ivanovich; Veresov, Albert Pavlovich; Rybakov, Ivan Alexandrovich; Trishin, Viktor Timofeevich; Goryannikov, Vladimir Mikhailovich; Savin, Vyacheslav Pavlovich; and Kashkarov, Igor Georgievich, 4,057,409, Cl. 65-154.000.

Kasper, Alan Henry: *See*—
Mathe, Istvan; and Kasper, Alan Henry, 4,057,314, Cl. 339-97.00R.

Kater, Charles E.: *See*—
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Kato, Saburo: *See*—
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Kato, Yoshiaki: *See*—
Imahori, Seiichi; Kaneko, Masaharu; and Kato, Yoshiaki, 4,057,539, Cl. 260-155.000.

Kaufman, Harold B., Jr., to DCA Food Industries, Inc. Food processor with an air balancing system. 4,056,950, Cl. 62-381.000.

Kaufman, Joseph; and Prais, Alois G., to Becton, Dickinson and Company. Blood-gas syringe. 4,057,052, Cl. 128-2.00F.

Kawaguchi, Mamoru. Blood circulation stimulator. 4,057,046, Cl. 128-24.00R.

Kawamoto, Tadashi: *See*—
Nakatsuka, Ryuzo; Saito, Kenji; and Kawamoto, Tadashi, 4,057,674, Cl. 428-481.000.

Kawamura, Yoshio: *See*—
Moriyama, Shigeo; Harada, Tatsuo; Kawamura, Yoshio; Hashimoto, Seiya; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; and Hosaka, Sumio, 4,057,347, Cl. 355-67.000.

Kawanami, Shunpei. Means and method for bending elongated materials incorporating two arms. 4,056,960, Cl. 72-128.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Yoshida, Toshio, 4,056,942, Cl. 61-65.000.

Kawashima, Syunichiro; Nishida, Masamitsu; Matsuo, Yoshihiro; Ouchi, Hiromu; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Method of making a transparent ferroelectric ceramic element. 4,057,324, Cl. 350-150.000.

Keeler Corporation: *See*—
Driesenga, Edwin J., 4,056,864, Cl. 16-126.000.

Keen, William Elgin, Jr.: *See*—
Atkiss, Thomas Clifford; and Keen, William Elgin, Jr., 4,057,440, Cl. 148-6.15Z.

Keiper GmbH: *See*—
Hopf, Heribert; and Schramm, Siegfried, 4,057,239, Cl. 269-170.000.

Kelman, Charles. Intraocular lens and method of implanting same. 4,056,855, Cl. 3-13.000.

Kelp, Fritz: *See*—
Tratz, Herbert; Kelp, Fritz; and Netsch, Erich, 4,057,103, Cl. 165-11.000.

Kemira Oy: *See*—
Backlund, Sigurd Alfons, 4,057,057, Cl. 128-142.400.

Kenealy, Brian Vaughan. Valve operating mechanism. 4,056,984, Cl. 74-89.150.

Kenigsberg, Irwin Jeffrey; and Paul, William Francis, to United Technologies Corporation. Extended arm bifilar and method to eliminate second order vibration excitation. 4,057,363, Cl. 416-145.000.

Kennametal Inc.: *See*—
Bator, James S., 4,056,871, Cl. 407-114.000.

Kerouac, Adrian R., to American Electromedics Corporation. Hand held ear test probe. 4,057,051, Cl. 128-2.00Z.

Kessler, Hans. Serving container for liquids or pourable materials contained in cardboard packages. 4,057,175, Cl. 222-86.000.

Kessler, Theodore P., to Timron, Inc. Shipping carton for plush reels. 4,057,143, Cl. 206-400.000.

Keszler, Julius L. Bacon-like meat product of reduced fat content. 4,057,650, Cl. 426-92.000.

Ketelsen, Peter H. Apparatus for calibration of a moisture analyzer. 4,056,966, Cl. 73-1.00G.

Keutschegger, Adolf: *See*—
Hacman, Dionys; and Keutschegger, Adolf, 4,057,316, Cl. 350-1.000.

Keyes Fibre Company: *See*—
Payne, Joe R., 4,057,169, Cl. 220-306.000.

Keystone Consolidated Industries, Inc.: *See*—
Glass, Dwight W., 4,056,955, Cl. 70-422.000.

Kidd, Kenneth B. Vehicle Trailer. 4,057,282, Cl. 296-10.000.

Kijima, Shizumasa; Yamatu, Isao; Hamamura, Kimio; Minami, Norio; Yamagishi, Youji; and Inai, Yuichi, to Eisai Co., Ltd. Process for synthesis of boric acid ester. 4,057,568, Cl. 260-462.00R.

Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; and Nishihara, Akira, to Kowa Chemical Industry Ltd. Methods for preparing stable silica sols and inorganic coating compositions. 4,057,525, Cl. 260-29.40R.

Kikuchi, Matsunosuke: *See*—
Maeda, Kunihiro; Imahasi, Hiromichi; and Kikuchi, Matsunosuke, 4,057,458, Cl. 156-603.000.

Killian, John C., Jr.; and Morse, John B., to Polaroid Corporation. Accessory adapter. 4,057,816, Cl. 354-293.000.

Kim, Yung K.: *See*—
Carter, Philip L.; Kim, Yung K.; and Riley, Michael O., 4,057,566, Cl. 260-448.20H.

Kimoto, Takahiro: *See*—
Koike, Wataro; Kimoto, Takahiro; and Matsui, Sadayoshi, 4,057,555, Cl. 260-301.000.

Kimura, Akio; Seki, Kenji; Ukita, Mamoru; Asahi, Satoshi; and Tagami, Sanae, to Idemitsu Kosan Company Limited. Process for producing block copolymers. 4,057,600, Cl. 260-878.00B.

Kimura, Akitaka: *See*—
Hoshikawa, Katuyuki; Noda, Soji; and Kimura, Akitaka, 4,057,090, Cl. 152-347.000.

Kimura, Goro; and Sekine, Junzo, to Tokyo Tanabe Company, Limited. Alkyl amino-glucopyranoside derivative and process for producing the same. 4,057,684, Cl. 536-4.000.

King, Robert Paul, to British Petroleum Company Limited, The. Pipelines. 4,057,082, Cl. 138-99.000.

Kinoshita, Hisahiro, to Mitsui Mining & Smelting Co., Ltd.; and Hachinohe Smelting Co., Ltd. Method for the manufacture of mercury free sulfuric acid. 4,057,423, Cl. 75-109.000.

Kinoshita, Masayuki: *See*—
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Katsuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,057,469, Cl. 195-51.00G.

Kinoshita, Mototaka; Okabe, Akio; and Ando, Susumu, to Lion Fat & Oil Co., Ltd. Method for treating a waste water containing a nonionic surface active agent. 4,057,495, Cl. 210-44.000.

Kinuhata, Koji; Amano, Kitsutaro; Sasaki, Hiroshi; and Yamamoto, Hideo, to Kokusai Denshin Denwa Kabushiki Kaisha. System for converting number of lines of television signal. 4,057,835, Cl. 358-140.000.

Kirschner, Helmut: *See*—
Lechner, Gunther; Pritscher, Karl; and Kirschner, Helmut, 4,057,142, Cl. 206-332.000.

Kitatani, Tatsuyuki. Floor cleaning device. 4,057,353, Cl. 401-43.000.

Kiwior, Alexander Michael; and Bode, James Daniel, to Bendix Corporation. Fuel break-up disc for injection valve. 4,057,190, Cl. 239-558.000.

Klass, Donald L., to Union Oil Company of California. Process for the preparation of unsaturated esters. 4,057,575, Cl. 560-245.000.

Klaubert, Dieter H.: *See*—
Sellstedt, John H.; and Klaubert, Dieter H., 4,057,632, Cl. 424-248.540.

Klauser, Rolf Marcus. Film holder for bite-wing radiographs. 4,057,732, Cl. 250-479.000.

Klaxon S.A.: *See—*
Warnod, Bertrand Antoine, 4,057,799, Cl. 340-388.000.
Kleinedler, Gary Evan: *See—*
Cranston, Benjamin Howell; Kleinedler, Gary Evan; Machusak, Donald Arthur; and Wiechard, Charles Augustus, 4,057,187, Cl. 228-107.000.
Klimo, Robert G.: *See—*
Artrip, Robert W.; and Klimo, Robert G., 4,057,752, Cl. 318-345.00B.
Klinger, Friedrich; Beran, Josef; and Brezina, Jan, to Carl Schenck AG. Method and hydraulic testing apparatus for performing resonance tests. 4,056,974, Cl. 73-92.000.
Klockner-Werke AG: *See—*
Warnke, Hans; and Boer, Werner, 4,057,006, Cl. 91-487.000.
Watermann, Willy, 4,056,941, Cl. 61-45.00D.
Klose, Karl W., to Cooper Tire and Rubber Company. Tire stitching apparatus. 4,057,455, Cl. 156-410.000.
Knop, Karl, to RCA Corporation. Simplified and improved diffractive subtractive color filtering technique. 4,057,326, Cl. 350-162.00R.
Kobashi, Kiyoshi: *See—*
Nohira, Hidetaka; and Kobashi, Kiyoshi, 4,056,933, Cl. 60-278.000.
Kobayashi, Hajime: *See—*
Endo, Ichiro; Kobayashi, Hajime; and Takekawa, Nobuhiro, 4,057,016, Cl. 101-465.000.
Kobayashi, Hiroaki: *See—*
Kobayashi, Seihin; Torii, Michihiro; and Kobayashi, Hiroaki, 4,057,606, Cl. 264-24.000.
Kobayashi, Seihin; Torii, Michihiro; and Kobayashi, Hiroaki, to Fuji Electrochemical Co., Ltd. Method of producing anisotropic ferrite magnet. 4,057,606, Cl. 264-24.000.
Kobe Steel, Ltd.: *See—*
Tani, Yoshio, 4,056,911, Cl. 52-738.000.
Koblick, Jeffrey M., to K-Tel International, Inc. Ski pole. 4,057,261, Cl. 280-11.37H.
Koch, Henning: *See—*
Biere, Helmut; Ahrens, Hanns; Rufer, Clemens; Schroder, Eberhard; and Koch, Henning, 4,057,640, Cl. 424-274.000.
Koch, Richard C., to Regency Electronics, Inc. Frequency synthesized scanner having conductive programming elements for channel selection. 4,057,760, Cl. 325-455.000.
Kodis, Robert D., to Di/An Controls, Inc. Bar code printing system. 4,057,015, Cl. 101-93.290.
Koehring Company: *See—*
Lyle, John S., 4,057,222, Cl. 366-123.000.
Koek, Pieter: *See—*
de Mos, Jacob Mink; and Koek, Pieter, 4,057,226, Cl. 366-244.000.
Kohlmann, Friedrich-Wilhelm: *See—*
Gutsche, Klaus; Kohlmann, Friedrich-Wilhelm; and Scharwachter, Peter, 4,057,545, Cl. 542-428.000.
Koike, Wataro; Kimoto, Takahiro; and Matsui, Sadayoshi, to Ihara Chemical Industry Co., Ltd. Process for producing saccharin. 4,057,555, Cl. 260-301.000.
Kojima, Tamotsu: *See—*
Fujiwhara, Mitsuto; Kojima, Tamotsu; and Matsuo, Syunji, 4,057,432, Cl. 96-56.200.
Kokkila, Kalevi, to Rauma-Repola Oy. Seat for work machine or vehicle. 4,057,213, Cl. 248-385.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Kinuhata, Koji; Amano, Kitsutaro; Sasaki, Hiroshi; and Yamamoto, Hideo, 4,057,835, Cl. 358-140.000.
Nakagome, Yukio; Teramura, Hiroichi; Fukata, Yasuo; and Yamasaki, Yasuhiro, 4,057,834, Cl. 358-133.000.
Kolarik, Stanislav: *See—*
Skrabak, Michal; Vavrik, Ernest; Kolarik, Stanislav; and Mazak, Milos, 4,057,497, Cl. 210-65.000.
Kolkhorst, Lee R., deceased; and by Kolkhorst, Virginia E., executrix. Motorcycle carriers. 4,057,182, Cl. 224-42.45R.
Kolkhorst, Virginia E., executrix: *See—*
Kolkhorst, Lee R., deceased; and Kolkhorst, Virginia E., executrix, 4,057,182, Cl. 224-42.45R.
Koller, Horst: *See—*
Biedermann, Wolfgang; and Koller, Horst, 4,057,513, Cl. 252-459.000.
Kolm, Ernest L. Venturi scrubber. 4,057,602, Cl. 261-63.000.
Komatsu, Tadaaki: *See—*
Ozawa, Masahiro; Inoue, Fumio; Komatsu, Tadaaki; and Matsuoka, Kimiaki, 4,057,591, Cl. 260-653.10R.
Kondo, Kenichi, to Kabushiki Kaisha Daini Seikosha. Display device. 4,057,325, Cl. 350-160.0LC.
Kondo, Ryohei: *See—*
Hatori, Kunitake; Ozaki, Toshihiko; and Kondo, Ryohei, 4,057,171, Cl. 221-6.000.
Konishi, Tadashi; and Kuno, Masashi, to Teijin Limited. Method for preventing scale formation in a continuous ester-interchange reaction for production of polyesters. 4,057,534, Cl. 260-75.00R.
Konishiroku Photo Industry Co., Ltd.: *See—*
Fujiwhara, Mitsuto; Kojima, Tamotsu; and Matsuo, Syunji, 4,057,432, Cl. 96-56.200.
Habu, Teiji; Wada, Tsuneo; Sasaki, Takashi; Itoh, Shigemasa; Ohmura, Takayoshi; Ishii, Hiroki; and Yamaguchi, Hisashi, 4,057,538, Cl. 260-117.000.
Koppers Company, Inc.: *See—*
Wert, Edward; and Fisher, Chester Donald, 4,056,867, Cl. 24-37.000.
Korb, A. Norman; and Breunsbach, Rex L., to Lok-A-Bin Systems, Inc. Film processor standby control system. 4,057,817, Cl. 354-298.000.
Korsch, Wolfgang, to Emil Korsch, Spezialfabrik fur Komprimiermaschinen. Rotary press. 4,057,381, Cl. 425-345.000.
Koshino, Kenji; and Itoh, Masayasu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vessel having a pattern-molded bottom, a manufacturing process therefor. 4,057,022, Cl. 113-120.00G.
Koshio, Takeshi: *See—*
Tanigaki, Takashi; Tanaka, Yoshikazu; and Koshio, Takeshi, 4,057,706, Cl. 219-146.000.
Kostrzewa, Siegfried, to Interatom, Internationale Atomreaktorbau GmbH. Integrated pressurized-water reactor and steam generator. 4,057,467, Cl. 176-65.000.
Kovacevic, Ostoja. Protection-hood or helmet-mask for use in environments dangerous to work. 4,057,058, Cl. 128-142.700.
Kowa Chemical Industry Ltd.: *See—*
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; and Nishihara, Akira, 4,057,525, Cl. 260-29.40R.
Kracklauer, Aloysius C., to Sparkler Mfg. Co. Continuous belt filter and filtration method. 4,057,437, Cl. 127-9.000.
Kraftwerk Union Aktiengesellschaft: *See—*
Fork, Kurt; Lambrecht, Dietrich; Waldmann, Hermann; and Hofmann, Helmut, 4,057,714, Cl. 264-494.000.
Schabert, Hans-Peter; and Laurer, Erwin, 4,057,077, Cl. 137-861.000.
Tratz, Herbert; Kelp, Fritz; and Netsch, Erich, 4,057,103, Cl. 165-11.000.
Krall, Hermann-Dieter; Weissel, Oskar; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for preparing diphenylamines. 4,057,581, Cl. 260-571.000.
Kramer, Kurt: *See—*
Lossack, Edgar; Kramer, Kurt; and Bulian, Gerd, 4,057,100, Cl. 164-418.000.
Kreh, Marvin J.: *See—*
Wiggins, Glenn C.; Kreh, Marvin J.; and Davis, Robert S., 4,057,667, Cl. 428-35.000.
Krekeler, Claude B., to Cincinnati Mine Machinery Company, The. Wedge arrangement for removably affixing a work tool or work tool holder to a base member on mining, road working or earth moving machinery, and the like. 4,057,294, Cl. 299-93.000.
Krepinsky, Jiri Jan: *See—*
Ferrari, Giorgio; and Krepinsky, Jiri Jan, 4,057,635, Cl. 424-261.000.
Krikorian, Esther; and Crisp, Michael J., to General Dynamics Corporation. Thin film photovoltaic diodes and method for making same. 4,057,476, Cl. 204-192.00P.
Kroft, Frederick J. Bumper-mounted truck servicing platform. 4,057,125, Cl. 182-91.000.
Kuban, William G. Tennis racket construction. 4,057,250, Cl. 273-73.00G.
Kubo, Seitoku; Kuramochi, Kojiro; Morisawa, Kunio; and Ohnuma, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Driving system for use in motor vehicle. 4,056,988, Cl. 74-695.000.
Kuck, Alfred: *See—*
Reichel, Kurt; Decker, Gerd; Kuck, Alfred; and Schulz, Erwin, 4,057,037, Cl. 123-32.0SP.
Kuck, Hans-Alfred: *See—*
Reichel, Kurt; Decker, Gerd; Kuck, Hans-Alfred; and Brandstetter, Walter, 4,057,038, Cl. 123-32.0SP.
Kudlacek, Donald S. Ratchet type operator for cable winches and the like. 4,057,220, Cl. 254-186.0HC.
Kudryavtsev, Alexandr Alexandrovich; Firsov, Vitaly Mikhailovich; Solinov, Evgeny Fedorovich; Symon, Mark Klavdievich; Litvinov, Pavel Ivanovich; Veresov, Albert Pavlovich; Rybakov, Ivan Alexandrovich; Trishin, Viktor Timofeevich; Goryannikov, Vladimir Mikhailovich; Savin, Vyacheslav Pavlovich; and Kashkarov, Igor Georgievich. Apparatus for making cathode-ray tube screens with integrally formed contoured fixtures. 4,057,409, Cl. 65-154.000.
Kuechler, Irvin R., to Vent-Cair, Inc. Method of installing apparatus for extracting grease and smoke. 4,056,877, Cl. 29-469.000.
Kukin, Ira: *See—*
Bennett, Robert P.; and Kukin, Ira, 4,057,398, Cl. 44-4.000.
Kumazawa, Kenichi, to Canon Kabushiki Kaisha. Drive apparatus for an optical system. 4,057,327, Cl. 350-187.000.
Kundig, Hans: *See—*
Hool, Gerhard; and Kundig, Hans, 4,057,648, Cl. 424-341.000.
Kuniyoshi, Shinji: *See—*
Moriyama, Shigeo; Harada, Tatsuo; Kawamura, Yoshio; Hashimoto, Seiya; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; and Hosaka, Sumio, 4,057,347, Cl. 355-67.000.
Kuno, Akira: *See—*
Sakakibara, Yasuyuki; and Kuno, Akira, 4,057,712, Cl. 364-426.200.
Kuno, Masashi: *See—*
Konishi, Tadashi; and Kuno, Masashi, 4,057,534, Cl. 260-75.00R.
Kunz, Raymond W., to Clairol Incorporated. Foot bath massager. 4,057,053, Cl. 128-25.00B.
Kuramochi, Kojiro: *See—*
Kubo, Seitoku; Kuramochi, Kojiro; Morisawa, Kunio; and Ohnuma, Kiyoshi, 4,056,988, Cl. 74-695.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Yoshida, Masafumi; Sasaki, Tohru; and Terasaki, Shuji, 4,057,660, Cl. 427-100.000.
Kurmeier, Hans-Adolf: *See—*
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,057,647, Cl. 424-340.000.

Kurosaki, Toshiei: *See*—
Moriyama, Shigeo; Harada, Tatsuo; Kawamura, Yoshio; Hashimoto, Seiya; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; and Hosaka, Sumio, 4,057,347, Cl. 355-67.000.

Kurreck, Manfred: *See*—
Mnilk, Reinhold; Kurreck, Manfred; and Tiede, Wolfgang, 4,056,914, Cl. 53-35.000.

Kurtz, Bruce E.; Guptill, Joel P.; and Fitch, Robert H., to Allied Chemical Corporation. Electrolytic production of alkali metal hydroxide. 4,057,474, Cl. 204-98.000.

Kurz, Wilfried: *See*—
Lux, Benno; Kurz, Wilfried; Hubert, Jean-Claude; Mollard, Francois; and Walt, Guido, 4,057,097, Cl. 164-60.000.

Kurzidim, Johannes: *See*—
Weber, Alfred; Muller, Rudolf; and Kurzidim, Johannes, 4,057,541, Cl. 260-239.55A.

Kushida, Shozo: *See*—
Nakagawa, Yasuichi; Ikenishi, Masataka; Hozumi, Yoshio; Kushida, Shozo; and Tsukutani, Koichi, 4,057,698, Cl. 200-16.00A.

Kuzmicki, Casimir B.: *See*—
Daghe, Joseph L.; and Kuzmicki, Casimir B., 4,057,357, Cl. 408-67.000.

Kuznetsov, Lev Alexeevich: *See*—
Bataev, Mikhail Kirillovich; Veits, Isaak Efimovich; Gorodetsky, Sergei Sergeevich; Macheret, Lev Ilich; Kuznetsov, Lev Alexeevich; Tjurin, Albert Vasilievich; and Yaunzem, Jury Eduardovich, 4,057,453, Cl. 156-390.000.

Kwon, Young D.: *See*—
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,056,973, Cl. 73-91.000.

Kyokado Engineering Co. Ltd.: *See*—
Suzuki, Manao, 4,056,937, Cl. 61-36.00B.

Laauwe, Robert H. Valved squeeze bottle for viscous products. 4,057,177, Cl. 222-215.000.

Labaz: *See*—
Pigerol, Charles; de Cointet de Fillain, Paul; Nanthavong, Souli; and Le Blay, Jacques, 4,057,530, Cl. 260-45.80N.
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Werbenec, Jean-Pierre; and Broll, Madeleine, 4,057,644, Cl. 424-325.000.

La Beaud, Louis J. Door jamb reinforcing plate. 4,057,275, Cl. 292-340.000.

Laboratoire Theranol: *See*—
Prugnaud, Robert Louis, 4,057,620, Cl. 424-35.000.

Lachenal, Jean-Michel: *See*—
Cassard, Jacques; Lachenal, Jean-Michel; and Romagnolo, Gerard, 4,056,873, Cl. 29-132.000.

Lacombe-Allard, Jean Francois, to Automatisme & Technique. Process and plant for the fritting of ceramic products. 4,057,702, Cl. 219-10.55A.

Lacy, James Volney: *See*—
Angner, Ronald Joseph; Blount, Marion Lee; and Lacy, James Volney, 4,057,693, Cl. 179-99.000.

Laine, Francois: *See*—
Antonini, Albert; Joffre, Philippe; and Laine, Francois, 4,057,592, Cl. 260-659.00A.

Lajos, Thomas Z. Atrioventricular electrode. 4,057,067, Cl. 128-418.000.

Lambert, Ronald F.; and Rogers, Howard G., to Polaroid Corporation. 2-Substituted benzimidazoles in multicolor diffusion transfer. 4,057,425, Cl. 96-3.000.

Lambrecht, Dietrich: *See*—
Fork, Kurt; Lambrecht, Dietrich; Waldmann, Hermann; and Hofmann, Helmut, 4,057,714, Cl. 264-494.000.

Lambright, Arthur James: *See*—
Goettler, Lloyd Arnold; and Lambright, Arthur James, 4,057,610, Cl. 264-108.000.

Lammermann, Heinz, to Robert Bosch GmbH. Method of making a filter. 4,056,876, Cl. 29-469.500.

Lamy, Jacques Edouard, to C. G. Doris (Compagnie Generale pour les Developpements Operationnels des Richesses Sous-marines). Process and device for laying submarine pipelines. 4,056,944, Cl. 61-107.000.

Lamy, Jacques Edouard, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris". Process and device for laying submarine pipelines. 4,056,945, Cl. 61-107.000.

La Porte, Arthur E., Jr. Gravity for solid particulate matter. 4,057,136, Cl. 193-3.000.

Lapple, Arnulf Ruediger: *See*—
Defago, Raymond; Schaffluetzel, Paul; Lapple, Arnulf Ruediger; and Hugelin, Bernard, 4,057,388, Cl. 8-2.50A.

Larson, Nils F.: *See*—
Hiatt, Carl C.; and Larson, Nils F., 4,056,910, Cl. 52-600.000.

Lasag S.A.: *See*—
Piguet, Christian, 4,057,741, Cl. 307-279.000.

Laupman, Robert Ronald, to Novanex Automation N. V. Device for protecting an audio amplifier against overload or short circuit. 4,057,767, Cl. 330-207.00P.

Laurent, Jacky Adrien Paul; and Croix-Marie, Francis Jean-Marie, to Bertin & Cie; and Arbel Industrie. Transfer system for long vehicles such as wagons. 4,057,018, Cl. 104-48.000.

Laurer, Erwin: *See*—
Schabert, Hans-Peter; and Laurer, Erwin, 4,057,077, Cl. 137-861.000.

Laurie, Albert F.; and Bunch, G. W. Baled tire product. 4,057,141, Cl. 206-304.000.

Lavigne, Geraldine. Urinary device. 4,057,062, Cl. 128-295.000.

Lawrence, Benjamin, to Procter & Gamble Company, The. Freeze particle process. 4,057,652, Cl. 426-388.000.

Lawrence, Dean M.: *See*—
Brownell, Roy D.; and Lawrence, Dean M., 4,057,122, Cl. 180-77.00S.

Lawrence Peska Assoc.: *See*—
Pace, Joseph L., 4,056,859, Cl. 7-14.10R.

Lawton, Emil A.: *See*—
Shaw, Graham C.; Lawton, Emil A.; and Jones, Leon L., 4,057,442, Cl. 149-109.400.

Leath, Jimmie E. Wire tightening tool. 4,057,221, Cl. 256-40.000.

Le Blay, Jacques: *See*—
Pigerol, Charles; de Cointet de Fillain, Paul; Nanthavong, Souli; and Le Blay, Jacques, 4,057,530, Cl. 260-45.80N.

Lebost, Barry Alan. Fluid turbine. 4,057,270, Cl. 290-54.000.

Lechner, Gunther; Pritscher, Karl; and Kirschner, Helmut, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Packaging of semiconductor discs. 4,057,142, Cl. 206-332.000.

Ledebuhr, Richard L.: *See*—
Hansen, Clarence M.; and Ledebuhr, Richard L., 4,057,137, Cl. 198-443.000.

Ledru, Pierre: *See*—
Angleraud, Rene; and Ledru, Pierre, 4,057,518, Cl. 260-2.50N.

Lee, George, to Hitco. Method for making buoyancy members. 4,057,450, Cl. 156-213.000.

Lee, Jin Ku. Valved receptacle closure. 4,057,167, Cl. 220-90.400.

Lee, Lester T. C.; Dege, Gerald J.; and Liu, Kang-Jen, to Allied Chemical Corporation. High performance, quality controlled bipolar membrane. 4,057,481, Cl. 204-296.000.

Lee, Man Shek, to GTE Automatic Electric Laboratories Incorporated. Active networks having biquadratic transfer functions. 4,057,766, Cl. 330-107.000.

Leighton, Milton D.: *See*—
Bushnell, James D.; Leighton, Milton D.; and McDonald, Thomas M., 4,057,491, Cl. 208-321.000.

Leisring, Herbert, to Robert Bosch GmbH. Film drive for motion picture apparatus. 4,057,335, Cl. 352-188.000.

LeMay, Dan B., to Tylan Corporation. Mass flow sensor system. 4,056,975, Cl. 73-202.000.

Lennon, Thomas J.: *See*—
Genova, Arthur F.; and Lennon, Thomas J., 4,057,759, Cl. 325-320.000.

Leo Pharmaceutical Products Ltd. A/S: *See*—
Petersen, Hans Jorgen, 4,057,636, Cl. 424-263.000.

Leo, Thomas J.; Loser, Thomas N.; and Reynolds, Michael J., to Wyrough and Loser, Inc. Rubber compositions having improved adhesion after thermal aging. 4,057,529, Cl. 260-42.470.

Lesnewich, Alexander: *See*—
Brace, Arthur A.; and Lesnewich, Alexander, 4,057,420, Cl. 75-53.000.

Lesney Products & Co. Limited: *See*—
Clark, William Frederick; and Maddocks, Richard Joseph, 4,057,612, Cl. 264-275.000.

Letts, Robert Arthur, to Airscrew Howden Limited. Method of making a dimensionally stable commutator. 4,056,882, Cl. 29-597.000.

Levine, Seymour; and Kane, Vinayak V., to Ortho Pharmaceutical Corporation. Azabicyclic compounds, and production thereof. 4,057,547, Cl. 544-184.000.

Lewis, Adolph Lee, to United States of America, Navy. Fiber optics electro-mechanical light switch. 4,057,719, Cl. 250-227.000.

Lewis, Roger N.: *See*—
Friedman, Ronald L.; and Lewis, Roger N., 4,057,567, Cl. 260-453.0RZ.

Ley, Anthony John; Metcalf, Eric; and Jeffery, Michael Cedric, to Solartron Electronic Group Ltd., The. Signal processors. 4,057,756, Cl. 324-77.00B.

Libbey-Owens-Ford Company: *See*—
Beckham, Robert R., 4,057,451, Cl. 156-320.000.
Daman, Lloyd W.; Marti, Don V., II; Mason, Freddie; and Shamp, Donald E., 4,057,410, Cl. 65-65.00A.

Liet, Cornelis Hendrikus: *See*—
Liet, Fredericus; and Liet, Cornelis Hendrikus, 4,057,295, Cl. 302-56.000.

Liet, Fredericus; and Liet, Cornelis Hendrikus, to Trioliet-Mullos Silo Nederland B.V. Silo having a cylindrical wall and a discharge device. 4,057,295, Cl. 302-56.000.

Lilja, Harry L. Sun shade for motor vehicle. 4,057,287, Cl. 296-97.00K.

Limberg, Allen LeRoy, to RCA Corporation. Current sensing circuit. 4,057,743, Cl. 307-296.00R.

Lin, Chiu-Hong, to Upjohn Company, The. 4,4,5,5-Tetradehydro-ω-aryl-11-deoxy-PGE_1, analogs. 4,057,572, Cl. 560-53.000.

Linder, Charles W.: *See*—
Wray, Betty B.; Stager, Peter F.; and Linder, Charles W., 4,057,145, Cl. 206-538.000.

Lindmayer, Joseph, to Solarex Corporation. Method of forming silicon solar energy cell having improved back contact. 4,056,879, Cl. 29-572.000.

Lindmayer, Joseph, to Solarex Corporation. Solar panel. 4,057,439, Cl. 136-89.00P.

Lion Fat & Oil Co., Ltd.: *See*—
Kinoshita, Mototaka; Okabe, Akio; and Ando, Susumu, 4,057,495, Cl. 210-44.000.

Lipatova, Tatyana Esperovna; Veselovsky, Roman Alexandrovich; and Pkhakadze, Georgy Alexandrovich. Adhesive for gluing together soft body tissues. 4,057,535, Cl. 260-77.5AC.

Lissaman, Peter B. S.: *See—*
MacCready, Paul B., Jr.; and Lissaman, Peter B. S., 4,057,280, Cl. 296-1.00S.

Lissy, Igor. Aircraft towing vehicle. 4,057,158, Cl. 214-330.000.

Littelfuse, Inc.: *See—*
Williamson, Harold L.; and Aryamane, Avinash P., 4,056,884, Cl. 29-623.000.

Litvinov, Pavel Ivanovich: *See—*
Kudryavtsev, Alexandr Alexandrovich; Firsov, Vitaly Mikhailovich; Solinov, Evgeny Fedorovich; Symon, Mark Klavdievich; Litvinov, Pavel Ivanovich; Veresov, Albert Pavlovich; Rybakov, Ivan Alexandrovich; Trishin, Viktor Timofeevich; Goryannikov, Vladimir Mikhailovich; Savin, Vyacheslav Pavlovich; and Kashkarov, Igor Georgievich, 4,057,409, Cl. 65-154.000.

Liu, Kang-Jen: *See—*
Lee, Lester T. C.; Dege, Gerald J.; and Liu, Kang-Jen, 4,057,481, Cl. 204-296.000.

Liu, Rosa H.: *See—*
Salmon, Sydney E.; and Liu, Rosa H., 4,057,618, Cl. 424-1.000.

Livingston, Wayne W.; and Melin, Gerald W., to Bemis Company, Inc. Methods of extruding plastic netting. 4,057,449, Cl. 156-167.000.

Lloyd, Wayne B., to Westinghouse Electric Corporation. Adjustable effectiveness support spring device. 4,057,238, Cl. 267-136.000.

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Shoemaker, Lloyd L., 4,057,189, Cl. 237-17.000.

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Halberstadt, Harry J.; and Rowley, Leroy S., 4,057,675, Cl. 429-39.000.

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Patel, Jitendra G.; Schora, Frank C.; and Loeding, John W., 4,057,402, Cl. 48-197.00R.

Lok-A-Bin Systems, Inc.: *See—*
Korb, A. Norman; and Breunsbach, Rex L., 4,057,817, Cl. 354-298.000.

Looser, Christian: *See—*
Gilliand, Andre Ferdinand Louis; and Looser, Christian, 4,056,921, Cl. 53-167.000.

Loseff, Herbert S. Sterile container for x-ray cassette holders. 4,057,731, Cl. 250-475.000.

Loser, Thomas N.: *See—*
Leo, Thomas J.; Loser, Thomas N.; and Reynolds, Michael J., 4,057,529, Cl. 260-42.470.

Lossack, Edgar; Kramer, Kurt; and Bulian, Gerd, to Vereinigte Aluminum-Werke Aktiengesellschaft. Apparatus for the lubrication of hot head continuous casting molds. 4,057,100, Cl. 164-418.000.

Lowell, William P.; and Jagunich, Douglas M., to Sperry Rand Corporation. Remote controlled test interface unit. 4,057,847, Cl. 364-200.000.

Lower, William E.: *See—*
Stasinski, David D.; and Lower, William E., 4,057,492, Cl. 209-366.500.

Lucas Industries Limited: *See—*
Scilly, Alec Harry, 4,057,744, Cl. 310-27.000.

Lueg, Karl: *See—*
Kalka, Josef; Waskonig, Walter; and Lueg, Karl, 4,056,981, Cl. 73-421.00B.

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Richtzenhain, Hermann; and Janssen, Paul, deceased, 4,057,552, Cl. 260-294.900.

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Lunden, Sidney L. Lumber stacking apparatus. 4,057,150, Cl. 214-6.0DK.

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Lux, Benno; Kurz, Wilfried; Hubert, Jean-Claude; Mollard, Francois; and Walt, Guido, to Battelle Memorial Institute. Casting process with instantaneous unidirectional solidification. 4,057,097, Cl. 164-60.000.

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Mabuchi, Kenichi, 4,057,677, Cl. 429-100.000.

MacCready, Paul B., Jr.; and Lissaman, Peter B. S., to AeroVironment Inc. Aerodynamic drag reduction devices for surface vehicles. 4,057,280, Cl. 296-1.00S.

MacDonald, Peter S., to Sargent Industries, Inc. Valve construction. 4,057,217, Cl. 251-308.000.

Macheret, Lev Ilich: *See—*
Bataev, Mikhail Kirillovich; Veits, Isaak Efimovich; Gorodetsky, Sergei Sergeevich; Macheret, Lev Ilich; Kuznetsov, Lev Alexeevich; Tjurin, Albert Vasilievich; and Yaunzem, Jury Eduardovich, 4,057,453, Cl. 156-390.000.

Machida, Hajime: *See—*
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Katsuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,057,469, Cl. 195-51.00G.

Machida Shigyo Co., Ltd.: *See—*
Hosoe, Masaya, 4,057,380, Cl. 425-324.100.

Machusak, Donald Arthur: *See—*
Cranston, Benjamin Howell; Kleinedler, Gary Evan; Machusak, Donald Arthur; and Wiechard, Charles Augustus, 4,057,187, Cl. 228-107.000.

Maddocks, Richard Joseph: *See—*
Clark, William Frederick; and Maddocks, Richard Joseph, 4,057,612, Cl. 264-275.000.

Madera, Anthony J.: *See—*
Bates, Albert M.; and Madera, Anthony J., 4,057,778, Cl. 340-2.000.

Maeda, Kunihiro; Imahasi, Hiromichi; and Kikuchi, Matsunosuke, to Hitachi, Ltd. Method of making nickel zinc ferrite by liquid-phase epitaxial growth. 4,057,458, Cl. 156-603.000.

Maessen, Jan Theodor Marie Francois: *See—*
Boelens, Harmannus; Maessen, Jan Theodor Marie Francois; and van der Linde, Leendert Maarten, 4,057,515, Cl. 252-522.000.

Maezono, Masakazu: *See—*
Hattori, Torao; and Maezono, Masakazu, 4,057,132, Cl. 192-87.190.

Mages, Bernhard: *See—*
Rock, Erich; and Mages, Bernhard, 4,057,303, Cl. 308-3.600.

Maggioni, Virginio: *See—*
Michellone, Giancarlo; and Maggioni, Virginio, 4,057,300, Cl. 303-113.000.

Magnuson, Robert M.: *See—*
Babb, Raymond E., 4,057,352, Cl. 356-178.000.

Mahlein, Hans; and Reichelt, Achim, to Siemens Aktiengesellschaft. Spectroscopically selective filter device. 4,057,321, Cl. 350-96.0WG.

Maier, William. Electrical outlet box mounting. 4,057,164, Cl. 220-3.600.

Maine, DeWitt C., to Maineline Sales Co., Inc. Solar heat collector. 4,057,048, Cl. 126-271.000.

Maineline Sales Co., Inc.: *See—*
Maine, DeWitt C., 4,057,048, Cl. 126-271.000.

Mainord, Kenneth R. Method for high temperature cleaning. 4,057,438, Cl. 134-2.000.

Mair, Georg; and Schabert, Hans-Peter, to Siemens Aktiengesellschaft. Nuclear reactor installation. 4,057,464, Cl. 176-37.000.

Majima, Kanji: *See—*
Nakagawa, Yunosuke; Majima, Kanji; and Miyamoto, Sigeyuki, 4,057,505, Cl. 252-96.000.

Malachesky, Paul A.: *See—*
Rao, Bhaskara M. L.; and Malachesky, Paul A., 4,057,676, Cl. 429-50.000.

Malco Plastics: *See—*
Tramposch, Herbert; and Polad, Michael, 4,057,011, Cl. 101-93.030.

Malek, John Michael. Process for hydroliquefying coal or like carbonaceous solid materials. 4,057,484, Cl. 208-8.000.

Malinge, Noel, to Engins Matra. Photogrammetric plotting apparatus. 4,057,336, Cl. 353-6.000.

Mallinckrodt, Inc.: *See—*
Wolfangel, Robert G., 4,057,616, Cl. 424-1.000.

Mammino, Joseph; and Jossel, Franklin, to Xerox Corporation. Magenta toner with a coated carrier. 4,057,426, Cl. 96-1.0SD.

Manzer, Leo Ernest, to Du Pont de Nemours, E. I., and Company. 2-Dialkylaminobenzyl and 2-dialkylaminomethylphenyl derivatives of selected transition metals. 4,057,565, Cl. 260-429.00R.

Marcatili, Enrique Alfredo Jose, to Bell Telephone Laboratories, Incorporated. Optical fiber waveguide having minimum modal dispersion. 4,057,320, Cl. 350-96.0GN.

Markos, Charles S.: *See—*
Dryden, Hugh L., Jr.; and Markos, Charles S., 4,057,543, Cl. 260-239.570.

Markwort, Helmut: *See—*
Muller, Eckart; Simo, Thomas; Markwort, Helmut; and Scholz, Berthold, 4,057,224, Cl. 366-336.000.

Marti, Don V., II: *See—*
Daman, Lloyd W.; Marti, Don V., II; Mason, Freddie; and Shamp, Donald E., 4,057,410, Cl. 65-65.00A.

Martin, Edna Henderson. Material pleater. 4,057,178, Cl. 223-35.000.

Martin Marietta Corporation: *See—*
Valentine, Jean A., 4,057,001, Cl. 86-1.00R.

Maruo, Masaya: *See—*
Arikawa, Hiroo; Akiyama, Fumitake; and Maruo, Masaya, 4,057,774, Cl. 337-164.000.

Marvin Glass & Associates: *See—*
Morrison, Howard J., 4,057,247, Cl. 273-1.00R.

Maschinenfabrik Augsburg-Nurnberg AG: *See—*
Isenberg, Gerhard; and Tuzinsky, Wolfgang, 4,057,369, Cl. 417-365.000.
Schwaebel, Rudolf, 4,057,362, Cl. 415-170.00R.

Mason, Freddie: *See—*
Daman, Lloyd W.; Marti, Don V., II; Mason, Freddie; and Shamp, Donald E., 4,057,410, Cl. 65-65.00A.

Mathe, Istvan; and Kasper, Alan Henry, to Bunker Ramo Corporation. Electrical connector including insulation-opening contact. 4,057,314, Cl. 339-97.00R.

Matovich, Edwin, to Thagard Technology Company. Fluid-wall reactor for high temperature chemical reaction processes. 4,057,396, Cl. 23-252.00R.

Matsubara, Masaki, to Olympus Optical Co., Ltd. Enlarging lens system. 4,057,328, Cl. 350-214.000.

Matsui, Sadayoshi: *See*—
Koike, Wataro; Kimoto, Takahiro; and Matsui, Sadayoshi, 4,057,555, Cl. 260-301.000.

Matsumoto, Yukimichi, to Kabushiki Kaisha Fuji Tekkosho. Winding machine. 4,056,918, Cl. 53-118.000.

Matsunaga, Setsuo: *See*—
Toriya, Jun; Sato, Masato; Shiraga, Ken; and Matsunaga, Setsuo, 4,057,472, Cl. 203-80.000.

Matsuo, Syunji: *See*—
Fujiwhara, Mitsuto; Kojima, Tamotsu; and Matsuo, Syunji, 4,057,432, Cl. 96-56.200.

Matsuo, Yoshihiro: *See*—
Kawashima, Syunichiro; Nishida, Masamitsu; Matsuo, Yoshihiro; Ouchi, Hiromu; and Hayakawa, Shigeru, 4,057,324, Cl. 350-150.000.

Matsuoka, Kimiaki: *See*—
Ozawa, Masahiro; Inoue, Fumio; Komatsu, Tadaaki; and Matsuoka, Kimiaki, 4,057,591, Cl. 260-653.10R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kawashima, Syunichiro; Nishida, Masamitsu; Matsuo, Yoshihiro; Ouchi, Hiromu; and Hayakawa, Shigeru, 4,057,324, Cl. 350-150.000.

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Numata, Shigeaki; and Sasaoka, Ryosuke, 4,057,370, Cl. 417-366.000.

Matsushita, Matsuo: *See*—
Shiga, Michio; Hirano, Kimitoshi; and Matsushita, Matsuo, 4,057,504, Cl. 252-33.000.

Matui, Sei, to Nippon Kogaku K.K. Lens system having large relative aperture and long focus. 4,057,330, Cl. 350-223.000.

Matula, Joseph P.: *See*—
Metrailer, William J.; and Matula, Joseph P., 4,057,487, Cl. 208-81.000.

Maurer, Fritz: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Eue, Ludwig, 4,057,418, Cl. 71-103.000.

Mausolf, Georg; Bellenbaum, Herbert; and Dietrich, Josef, to Salzgitter Maschinen AG. Reversible arrangement for transporting bulk materials. 4,057,139, Cl. 198-509.000.

Mavor, John: *See*—
Owen, Alan Ernest; and Mavor, John, 4,057,819, Cl. 357-23.000.

Mayer, J. Richard. Benthic semi-barrier to control the growth of weeds in aquatic environments. 4,056,936, Cl. 61-1.00R.

Mazak, Milos: *See*—
Skrabak, Michal; Vavrik, Ernest; Kolarik, Stanislav; and Mazak, Milos, 4,057,497, Cl. 210-65.000.

Mazzetti, Flavio J. Flow diversion sampler. 4,056,983, Cl. 73-423.00R.

McCarroll, Vincent P.: *See*—
van Valkenburg, Howard E.; and McCarroll, Vincent P., 4,056,971, Cl. 73-629.000.

McConnell, Albert L., to Scott Paper Company. Method of manufacturing a dry-formed, adhesively bonded, nonwoven fibrous sheet and the sheet formed thereby. 4,057,669, Cl. 428-152.000.

McDonald, Robert E.; and Canonico, Domenic A., to United States of America, Energy Research and Development Administration. Means of determining extrusion temperatures. 4,056,963, Cl. 72-253.00R.

McDonald, Thomas M.: *See*—
Bushnell, James D.; Leighton, Milton D.; and McDonald, Thomas M., 4,057,491, Cl. 208-321.000.

McGlashen, James Neil: *See*—
Holroyd, Eric; Goodfellow, Anthony Gerald; and McGlashen, James Neil, 4,057,447, Cl. 156-125.000.

McIntire, Floyd Cottam, to Abbott Laboratories. Chemically modified endotoxin immunizing agent. 4,057,685, Cl. 536-18.000.

McKee, Richard W.: *See*—
Andrews, Frank; and McKee, Richard W., 4,057,208, Cl. 246-125.000.

McManus, Ira J. Composite concrete slab and steel joist construction. 4,056,908, Cl. 52-334.000.

Mead Corporation, The: *See*—
Prot, Marcel G., 4,057,444, Cl. 156-69.000.

Meadow, Morton; and Berkowitz, Sidney, to FMC Corporation. Process for producing carbon disulfide. 4,057,613, Cl. 423-443.000.

Meadus, F. Weldon; Sparks, Bryan D.; Puddington, Ira E.; and Farnand, J. Redmond, to Canadian Patents and Development Limited. Separating organic material from tar sands or oil shale. 4,057,486, Cl. 208-11.0LE.

Medtronic, Inc.: *See*—
Comben, Richard H., 4,057,068, Cl. 128-419.00P.

Meier-Windhorst, Christian August. Apparatus for wet treatment of travelling webs. 4,056,954, Cl. 68-22.00R.

Melin, Gerald W.: *See*—
Livingston, Wayne W.; and Melin, Gerald W., 4,057,449, Cl. 156-167.000.

Melson, James L. Powered hand truck for climbing steps. 4,057,119, Cl. 180-8.00A.

Memmi, Massimo: *See*—
Bruno, Roberto; Memmi, Massimo; Berardi, Paolo; and Musso, Augusto, 4,057,424, Cl. 75-178.00A.

Mendelson, Wilford Lee; and Webb, Robert Lee, to SmithKline Corporation. Method of preparing 2,3-dichloroanisole. 4,057,585, Cl. 260-612.00D.

Menyhert, William R. Epoxy derivative compositions. 4,057,524, Cl. 260-29.2EP.

Merck & Co., Inc.: *See*—
Jones, Howard; and Shen, Tsung-Ying, 4,057,642, Cl. 424-304.000.
Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., 4,057,637, Cl. 424-263.000.

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Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,057,647, Cl. 424-340.000.

Merz, Kenneth M.; and Shapiro, Howard E., to TRW Inc. Termination for electrical resistor and method of making same. 4,057,777, Cl. 338-309.000.

Merz, Walter; and Nachtsheim, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of pinacolone. 4,057,583, Cl. 260-593.00R.

Messier, Russell Francis: *See*—
Wolfe, Robert Wade; and Messier, Russell Francis, 4,057,508, Cl. 252-301.40H.

Metallgesellschaft Aktiengesellschaft: *See*—
Muller, Eckart; Simo, Thomas; Markwort, Helmut; and Scholz, Berthold, 4,057,224, Cl. 366-336.000.

Metcalf, Eric: *See*—
Ley, Anthony John; Metcalf, Eric; and Jeffery, Michael Cedric, 4,057,756, Cl. 324-77.00B.

Metrailer, William J.; and Matula, Joseph P., to Exxon Research & Engineering Co. Fluid coking process. 4,057,487, Cl. 208-81.000.

Mette, Klaus Hermann; and St. Denis, Andrew Raoul, to Firan Electronics, Inc. Press true-hit safety counter. 4,057,713, Cl. 364-476.000.

Metzgar, Don P.; and Newhart, Raymond H., to Richardson-Merrell Inc. Process for detoxifying influenza B virus. 4,057,626, Cl. 424-89.000.

Metzler, Jay C., to Schlegel Corporation. Pile weatherstripping with interfitting shaped base. 4,057,668, Cl. 428-85.000.

Meyer, Bruno P.: *See*—
Theis, James V., Jr.; and Meyer, Bruno P., 4,057,360, Cl. 415-25.000.

Meyer, Rolf; and Burgess, John E., to G. D. Searle & Co. Multiple sample support assembly and apparatus for facilitating radioimmunoassays and the like. 4,057,148, Cl. 211-74.000.

MFE Corporation: *See*—
Banks, Frank H., 4,057,839, Cl. 360-93.000.

Micetich, Ronald G.; Morin, Robert B.; and Wilson, Kenneth E., to Connlab Holdings Limited. 4-Chloroazetidinone-1-(2',3'-dichloroisopropyl) acetates and process for preparing same. 4,057,540, Cl. 260-239.00A.

Michalik, Edmund R., to PPG Industries, Inc. Method of scoring glass using a scoring wheel having an arcuate scoring surface. 4,057,184, Cl. 225-2.000.

Michalon, Daniel, to Centre Stephanois de Recherches Mecaniques Hydromecanique et Frottement. Continuous transport system, in particular for public transport. 4,057,017, Cl. 104-20.000.

Michellone, Giancarlo; and Maggioni, Virginio, to FIAT Societa per Azioni. Motor vehicle braking system. 4,057,300, Cl. 303-113.000.

Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, to Daiichi Seiyaku Co., Ltd. Tyrosine derivatives and process for preparing the same. 4,057,629, Cl. 424-177.000.

Milchem Incorporated: *See*—
Elting, Katherine Anne Cline, 4,057,683, Cl. 526-194.000.

Miles Laboratories, Inc.: *See*—
Genshaw, Marvin Alden, 4,057,394, Cl. 23-230.00B.

Miller, Calvin Max, to Bell Telephone Laboratories, Incorporated. Optical fiber splicing technique. 4,057,448, Cl. 156-158.000.

Miller, Howard N.: *See*—
Perry, Robert H.; and Miller, Howard N., 4,057,753, Cl. 318-376.000.

Miller, Norman Jay; Zemaitis, John Anthony; and Zimmerman, Russell Lloyd, to Du Pont de Nemours, E. I., and Company. Circuit board pin. 4,057,315, Cl. 339-221.00R.

Minami, Norio: *See*—
Kijima, Shizumasa; Yamatu, Isao; Hamamura, Kimio; Minami, Norio; Yamagishi, Youji; and Inai, Yuichi, 4,057,568, Cl. 260-462.00R.

Minolta Camera Kabushiki Kaisha: *See*—
Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitu, 4,057,339, Cl. 355-3.00R.

Minox GmbH, Firma: *See*—
Grunbacher, Martin; and Johannsen, Hans Werner, 4,057,814, Cl. 354-204.000.

Misawa Homes Institute of Research and Development: *See*—
Hashimoto, Akihiro; Hayashi, Shigeo; Yamamoto, Sadao; and Chujo, Hitoshi, 4,057,608, Cl. 264-42.000.

Mitchell, Donald K.: *See*—
Hood, Frederick E.; Mitchell, Donald K.; and Uhring, Gary S., 4,057,023, Cl. 114-107.000.

Mitsubishi Chemical Industries Ltd.: *See*—
Imahori, Seiichi; Kaneko, Masaharu; and Kato, Yoshiaki, 4,057,539, Cl. 260-155.000.
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Katsuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,057,469, Cl. 195-51.00G.
Toriya, Jun; Sato, Masato; Shiraga, Ken; and Matsunaga, Setsuo, 4,057,472, Cl. 203-80.000.

Mitsubishi Monsanto Kasei Kabushiki Kaisha: *See*—
Yamamori, Masaji, 4,057,382, Cl. 425-387.100.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Yazaki, Takao; and Hattori, Kazuhide, 4,057,385, Cl. 425-466.000.

Mitsui Mining & Smelting Co., Ltd.: *See*—
Kinoshita, Hisahiro, 4,057,423, Cl. 75-109.000.

Mitterhummer, Gerhard; and Plehnert, Kurt, to Siemens Aktiengesell-

schaft. Method for manufacturing micro-wiring arrangements for contacting semiconductor circuits. 4,057,459, Cl. 156-630.000.

Miwa, Tamotsu: *See*—
Miki, Tosaku; Hosokawa, Yasuhiro; Miwa, Tamotsu; Fujita, Hiroshi; Asano, Masahide; and Aibara, Shunzo, 4,057,629, Cl. 424-177.000.

Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, to Dow Chemical Company, The. Synthetic resin fungicidal paint comprising 1,3-dithiolo-(4,5-b)pyrazin-2-ylidene-propanedinitrile 4-oxide. 4,057,517, Cl. 260-22.00R.

Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitu, to Minolta Camera Kabushiki Kaisha. Electrostatic latent image transfer type copying apparatus. 4,057,339, Cl. 355-3.00R.

Miyamoto, Sigeyuki: *See*—
Nakagawa, Yunosuke; Majima, Kanji; and Miyamoto, Sigeyuki, 4,057,505, Cl. 252-96.000.

Miyatake, Takafumi: *See*—
Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; Yoda, Haruo; and Kameyama, Masayoshi, 4,057,845, Cl. 364-200.000.

Mizuno, Tamotsu: *See*—
Ono, Tetsuhiro; Aramaki, Minoru; Mizuno, Tamotsu; and Fujinaga, Masao, 4,057,614, Cl. 423-490.000.

Mizusawa, Shinichiro; Tamura, Chiharu; Nakamura, Norihiko; and Yanagihara, Hiromichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. After-burning preventive and flame-out apparatus. 4,056,934, Cl. 60-311.000.

Mnilk, Reinhold; Kurreck, Manfred; and Tiede, Wolfgang, to Holstein & Kappert Aktiengesellschaft. Method and apparatus for removing residue of filling material in machines for manufacturing filled plastic containers. 4,056,914, Cl. 53-35.000.

Mobil Oil Corporation: *See*—
Florian, John, 4,057,651, Cl. 229-2.500.
Gross, Benjamin; and Owen, Hartley, 4,057,397, Cl. 23-288.00B.

Mobile Auto Crushers Corporation of America: *See*—
Smith, Gary D., 4,057,010, Cl. 100-50.000.

Moczygemba, George A., to Phillips Petroleum Company. Block copolymers of alkadienes and monovinyl arenes. 4,057,601, Cl. 260-880.00B.

Moe, James S.; Carter, Marvin B.; and Carter, Ray L. Combined rotary-reciprocating piston compressor. 4,057,367, Cl. 417-273.000.

Molinari, Alcide: *See*—
Vagliani, Federico; and Molinari, Alcide, 4,057,690, Cl. 179-15.0AS.

Mollard, Francois: *See*—
Lux, Benno; Kurz, Wilfried; Hubert, Jean-Claude; Mollard, Francois; and Walt, Guido, 4,057,097, Cl. 164-60.000.

Monahan, John F., to Harris Corporation. Contrast compression circuits. 4,057,828, Cl. 358-32.000.

Monsanto Company: *See*—
Goettler, Lloyd Arnold; and Lambright, Arthur James, 4,057,610, Cl. 264-108.000.

Montagna, Angelo Anthony; Somers, Allen Evarts; Peake, Stephen Luther; and Chun, Sun Woong, to Gulf Research & Development Company. Catalytic pour point reduction of petroleum hydrocarbon stocks. 4,057,488, Cl. 208-89.000.

Montagna, Angelo Anthony; Somers, Allen Evarts; and Sebulsky, Raynor Tyler, to Gulf Research & Development Company. Process for producing a transformer oil having lower pour point and improved oxidation stability. 4,057,489, Cl. 208-89.000.

Moore Company, Inc., The: *See*—
Moore, Junius Thomas, 4,057,211, Cl. 248-332.000.

Moore, Junius Thomas, to Moore Company, Inc., The. Safety system for overhead support of weighted articles. 4,057,211, Cl. 248-332.000.

Moorehead, Robert M., to Spectradyne, Inc. Communications TV monitoring and control system. 4,057,829, Cl. 358-86.000.

Morbark Industries, Inc.: *See*—
Smith, Leward N., 4,057,192, Cl. 241-92.000.

Mori, Masanori, to Aisin Seiki Kabushiki Kaisha. Self-adjusting release mechanism for a clutch assembly. 4,057,135, Cl. 192-111.00A.

Morimatsu, Hideharu: *See*—
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,057,779, Cl. 340-3.00C.

Morin, Robert B.: *See*—
Micetich, Ronald G.; Morin, Robert B.; and Wilson, Kenneth E., 4,057,540, Cl. 260-239.00A.

Morinaga Milk Industry Co., Ltd.: *See*—
Okada, Katsuto; Ogasa, Katsuhiro; and Tomita, Mamoru, 4,057,655, Cl. 426-583.000.

Morisawa, Kunio: *See*—
Kubo, Seitoku; Kuramochi, Kojiro; Morisawa, Kunio; and Ohnuma, Kiyoshi, 4,056,988, Cl. 74-695.000.

Morita, Toshio, to Westinghouse Electric Corporation. Method of operating a nuclear reactor which maintains a substantially constant axial power distribution profile with changes in load. 4,057,463, Cl. 176-22.000.

Moriyama, Shigeo; Harada, Tatsuo; Kawamura, Yoshio; Hashimoto, Seiya; Takanashi, Akihiro; Kurosaki, Toshiei; Kuniyoshi, Shinji; and Hosaka, Sumio, to Hitachi, Ltd. Optical exposure apparatus. 4,057,347, Cl. 355-67.000.

Morrison, Charles F., Jr.; and Weaver, Benson C., to Valleylab, Inc. Electrosurgical method and apparatus for initiating an electrical discharge in an inert gas flow. 4,057,064, Cl. 128-303.170.

Morrison, Howard J., to Marvin Glass & Associates. Balancing toy set. 4,057,247, Cl. 273-1.00R.

Morse, John B.: *See*—
Killian, John C., Jr.; and Morse, John B., 4,057,816, Cl. 354-293.000.

Motorola Inc.: *See*—
Greeley, Ashford C.; and Daniel, Sam M., 4,057,708, Cl. 235-413.000.

Mowrey, Rowland George; Smith, Donald Arthur; and Sutton, Richard Calvin, to Eastman Kodak Company. Photographic elements containing anionic organic acids. 4,057,428, Cl. 96-74.000.

Mu, Paul T.: *See*—
Rayburn, Billy R., 4,056,891, Cl. 34-55.000.

Muehllehner, Gerd; and Buchin, Michael P., to G. D. Searle & Co. Positron imaging system with improved count rate and tomographic capability. 4,057,727, Cl. 250-363.00S.

Mueller Co.: *See*—
Daghe, Joseph L.; and Kuzmicki, Casimir B., 4,057,357, Cl. 408-67.000.

Mueller, Otto, to Staubli Ltd. Jacquard-harness of a weaving machine. 4,057,084, Cl. 139-59.000.

Muhlhoff, Heinz: *See*—
Volker, Martin; and Muhlhoff, Heinz, 4,057,228, Cl. 366-79.000.

Muller, Eckart; Simo, Thomas; Markwort, Helmut; and Scholz, Berthold, to Metallgesellschaft Aktiengesellschaft. Process and apparatus for directly contacting two counterflowing immiscible liquid phases. 4,057,224, Cl. 366-336.000.

Muller, Hans. Filter apparatus and filter element therefor. 4,057,501, Cl. 210-331.000.

Muller, Hans Rudolf, to Sundstrand Data Control, Inc. Low altitude head up display for aircraft. 4,057,782, Cl. 340-27.0AT.

Muller, Johannes Cornelius Antonius: *See*—
Ong, Daniel; and Muller, Johannes Cornelius Antonius, 4,057,331, Cl. 350-285.000.

Muller, Marcel: *See*—
Furst, Andor; Gutzwiller, Jurg; Muller, Marcel; Wiechert, Rudolf; Eder, Ulrich; and Neef, Gunter, 4,057,561, Cl. 260-345.90S.

Muller, Rudolf: *See*—
Weber, Alfred; Muller, Rudolf; and Kurzidim, Johannes, 4,057,541, Cl. 260-239.55A.

Mulvey, Dennis M.: *See*—
Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad P., 4,057,637, Cl. 424-263.000.

Mumford, George V.: *See*—
Fillmore, William E.; Garver, Wayne E.; Mumford, George V.; and Price, James H., 4,057,159, Cl. 215-222.000.

Mundlos, Eberhard: *See*—
Bachmann, Wilfried; Gnabs, Christian; Janecka, Kurt; Mundlos, Eberhard; Papenfuhs, Theodor; and Waese, Gerhard, 4,057,576, Cl. 260-525.000.

Munsey, Clarence Jennings, to Robot Research, Inc. Slow scan television scan converter. 4,057,836, Cl. 358-140.000.

Murali, Beegamudre N.: *See*—
Reid, Karl N., Jr.; Ross, James Burr; and Murali, Beegamudre N., 4,057,059, Cl. 128-145.800.

Muranaka, Masakazu; and Kato, Saburo, to Ricoh Co., Ltd. Apparatus for detachably mounting a record sheet in place in a sheet type recorder/player. 4,057,256, Cl. 274-9.00C.

Muschelknautz, Edgar; Burkholz, Armin; Wieschen, Hermann; Guth, Hans; and Richter, Wolfgang, to Bayer Aktiengesellschaft. Separator, especially for chimneys. 4,057,075, Cl. 137-171.000.

Musso, Augusto: *See*—
Bruno, Roberto; Memmi, Massimo; Berardi, Paolo; and Musso, Augusto, 4,057,424, Cl. 75-178.00A.

Naarden International, N.V.: *See*—
Boelens, Harmannus; and Wobben, Hendrik Jacob, 4,057,516, Cl. 252-522.000.

Nabisco, Inc.: *See*—
Albrecht, Robert J.; and Fraunberger, Martin J., 4,057,078, Cl. 137-625.200.

Nabucet, Georges Joseph Marie; and Champ, Michel Andre. Pyrotechnic cutter apparatus. 4,057,026, Cl. 114-221.00A.

Nachtrieb, Paul W. Pump structure. 4,057,375, Cl. 418-189.000.

Nachtsheim, Dieter: *See*—
Merz, Walter; and Nachtsheim, Dieter, 4,057,583, Cl. 260-593.00R.

Nagasawa, Michitaro: *See*—
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Katsuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,057,469, Cl. 195-51.00G.

Nagashima, Kunio: *See*—
Goto, Hirokazu; and Nagashima, Kunio, 4,057,691, Cl. 179-18.0GF.

Nahas, Nicholas C.: *See*—
Vadovic, Charles J.; Wesselhoft, Robert D.; and Nahas, Nicholas C., 4,057,512, Cl. 252-413.000.

Nakagawa, Yasuichi; Ikenishi, Masataka; Hozumi, Yoshio; Kushida, Shozo; and Tsukutani, Koichi, to Kabushiki Kaisha Daini Seikosha. Switching mechanism of a timepiece. 4,057,698, Cl. 200-16.00A.

Nakagawa, Yunosuke; Majima, Kanji; and Miyamoto, Sigeyuki, to Kao Soap Co., Ltd. Liquid cleaning and bleaching composition. 4,057,505, Cl. 252-96.000.

Nakagome, Yukio; Teramura, Hiroichi; Fukata, Yasuo; and Yamasaki, Yasuhiro, to Kokusai Denshin Denwa Kabushiki Kaisha. Signal compression system for binary digital signals. 4,057,834, Cl. 358-133.000.

Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Exposure control circuit. 4,057,809, Cl. 354-23.00D.

Nakamura, Koyo; and Sanbuichi, Hiroshi, to Nissan Motor Co., Ltd. Control system for promoting catalytic removal of noxious compo-

nents from exhaust gas of internal combustion engine. 4,056,932, Cl. 60-276.000.
Nakamura, Norihiko: *See*—
Mizusawa, Shinichiro; Tamura, Chiharu; Nakamura, Norihiko; and Yanagihara, Hiromichi, 4,056,934, Cl. 60-311.000.
Nakano, Masaki: *See*—
Yamamoto, Hajime; Kano, Tsuyoshi; and Nakano, Masaki, 4,057,507, Cl. 252-301.40S.
Nakashima, Katsushi, to Aisin Seiki Kabushiki Kaisha. Fluid level indicator. 4,057,700, Cl. 200-84.00C.
Nakatsuka, Ryuzo; Saito, Kenji; and Kawamoto, Tadashi, to Sumitomo Bakelite Company, Limited. Process for preparing dry, laminating impregnated papers or cloths, and process for producing decorative plates using the same. 4,057,674, Cl. 428-481.000.
Nalco Chemical Company: *See*—
Phillips, Kenneth G.; Ballweber, Edward G.; and Selvarajan, Radhakrishnan, 4,057,580, Cl. 260-567.60P.
Rosenberger, Roy R., 4,057,223, Cl. 366-172.000.
Namiki, Junji, to Nippon Electric Company, Ltd. Device for phase synchronizing a reproduced reference carrier signal with windows specified for preselected ones of amplitude and phase modulated signal points. 4,057,762, Cl. 329-50.000.
Nanthavong, Souli: *See*—
Pigerol, Charles; de Cointet de Fillain, Paul; Nanthavong, Souli; and Le Blay, Jacques, 4,057,530, Cl. 260-45.80N.
Narita, Kazutoyo; Sakaue, Tadashi; and Niino, Yuzi, to Hitachi, Ltd. Semiconductor device with composite metal heat-radiating plate onto which semiconductor element is soldered. 4,057,825, Cl. 357-81.000.
Naruse, Kiyoji; and Ito, Tadashi, to Naruse, Kiyoji. Liquid adhesive composition. 4,057,522, Cl. 260-28.5AS.
Nass, Raymond D.: *See*—
Damico, Frank M.; and Nass, Raymond D., 4,057,240, Cl. 269-325.000.
National Gypsum Company: *See*—
Dawdy, Jack A., 4,056,904, Cl. 52-127.000.
Johnson, Robert M.; Winkowski, Daniel A.; and Stiling, Rodney A., 4,057,662, Cl. 427-209.000.
Stiling, Rodney A.; Burkard, Edward A.; and Johnson, Robert M., 4,057,443, Cl. 156-43.000.
National Research Development Corporation: *See*—
Ash, Eric Albert; and Dias Soares, Oliverio Delfim, 4,057,319, Cl. 350-96.00C.
Grossfield, Karl, 4,057,794, Cl. 340-311.000.
Hill, Christopher Rowland, 4,057,049, Cl. 128-2.00V.
National Steel Corporation: *See*—
Jennings, Larry D.; and Hazen, Wayne W., 4,057,611, Cl. 423-127.000.
Ross, George P.; and Bedortha, James L., 4,057,232, Cl. 266-227.000.
Natkaniec, Benedykt: *See*—
Chrobak, Eryk; Natkaniec, Benedykt; Wasyleczko, Zenon; Stawinski, Antoni; and Roczek, Andrzej, 4,056,929, Cl. 59-85.000.
Naumann, Klaus; Lurssen, Klaus; Sasse, Klaus; Holtschmidt, Ulrich; and Schwarzmann, Gunter, to Bayer Aktiengesellschaft. Methods and compositions for regulating plant growth using piperazine compounds. 4,057,413, Cl. 71-76.000.
Needs, Howard Curtis; and Spapens, Harald Henricus Cornelis Maria, to U.S. Philips Corporation. Television camera comprising a rigid housing. 4,057,837, Cl. 358-254.000.
Neef, Gunter: *See*—
Furst, Andor; Gutzwiller, Jurg; Muller, Marcel; Wiechert, Rudolf; Eder, Ulrich; and Neef, Gunter, 4,057,561, Cl. 260-345.90S.
Nelson, Roger John, to Deere & Company. Tractor with hydraulic draft control. 4,057,109, Cl. 172-7.000.
Nemeth, Joseph Daniel, to Babcock & Wilcox Company, The. Snubber. 4,057,237, Cl. 267-134.000.
Ness, Philip J. Gun rack. 4,057,183, Cl. 224-42.45R.
Netsch, Erich: *See*—
Tratz, Herbert; Kelp, Fritz; and Netsch, Erich, 4,057,103, Cl. 165-11.000.
Neufeldt, Allen Abram. Refuse compacting vehicle. 4,057,154, Cl. 214-82.000.
Neumann, Gerard: *See*—
Canonne, Paul; and Neumann, Gerard, 4,057,716, Cl. 200-153.00H.
New York School of Locksmithing, Inc.: *See*—
Gilliam, Charles David, 4,056,956, Cl. 70-446.000.
Newhart, Raymond H.: *See*—
Metzgar, Don P.; and Newhart, Raymond H., 4,057,626, Cl. 424-89.000.
Newman, James W.; and Zajac, Ronald E., to Windings, Inc. Package of flexible material with oval payout tube. 4,057,203, Cl. 242-163.000.
Niemann, Fred T. Portable water evacuator. 4,057,366, Cl. 417-234.000.
Niino, Yuzi: *See*—
Narita, Kazutoyo; Sakaue, Tadashi; and Niino, Yuzi, 4,057,825, Cl. 357-81.000.
Nippon Electric Company, Ltd.: *See*—
Goto, Hirokazu; and Nagashima, Kunio, 4,057,691, Cl. 179-18.0GF.
Namiki, Junji, 4,057,762, Cl. 329-50.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,057,764, Cl. 330-264.000.
Nippon Kogaku K.K.: *See*—
Akasaka, Shigeo; and Tanaka, Hiroaki, 4,057,333, Cl. 352-141.000.
Matui, Sei, 4,057,330, Cl. 350-223.000.
Nippon Soken, Inc.: *See*—
Sakakibara, Yasuyuki; and Kuno, Akira, 4,057,712, Cl. 364-426.200.
Nippon Steel Corporation: *See*—
Tanigaki, Takashi; Tanaka, Yoshikazu; and Koshio, Takeshi, 4,057,706, Cl. 219-146.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Hattori, Takeshi; and Adachi, Fumiyuki, 4,057,758, Cl. 325-56.000.
Nishida, Masamitsu: *See*—
Kawashima, Syunichiro; Nishida, Masamitsu; Matsuo, Yoshihiro; Ouchi, Hiromu; and Hayakawa, Shigeru, 4,057,324, Cl. 350-150.000.
Nishihara, Akira: *See*—
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; and Nishihara, Akira, 4,057,525, Cl. 260-29.40R.
Nishijima, Koji: *See*—
Sugimoto, Keiichi; Nishijima, Koji; Akimoto, Hiroshi; Hanaoka, Tadashi; and Kakeya, Nobuharu, 4,057,544, Cl. 260-239.100.
Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Katsuhiko; Machida, Hajime; and Nagasawa, Michitaro, to Mitsubishi Chemical Industries Ltd. Process for the microbiological oxidation of steroids. 4,057,469, Cl. 195-51.00G.
Nishimura, Izuhiko, to Kabushiki Kaisha Suwa Seikosha. Electronic circuit for eliminating chatter. 4,057,738, Cl. 307-247.00A.
Nissan Motor Co., Ltd.: *See*—
Aono, Shigeo, 4,057,042, Cl. 123-119.0EC.
Arima, Tatsuhiro, 4,057,290, Cl. 297-389.000.
Harada, Tetsuya, 4,057,043, Cl. 123-119.00A.
Hata, Yoshitaka, 4,056,931, Cl. 60-274.000.
Nakamura, Koyo; and Sanbuichi, Hiroshi, 4,056,932, Cl. 60-276.000.
Nissen, Richard Bent. Glued corner-joints. 4,057,356, Cl. 403-219.000.
Nitron Corporation/McDonnell-Douglas Corporation: *See*—
Patel, Pramodbhai D., 4,057,821, Cl. 357-23.000.
Noda, Soji: *See*—
Hoshikawa, Katuyuki; Noda, Soji; and Kimura, Akitaka, 4,057,090, Cl. 152-347.000.
Nohira, Hidetaka; and Kobashi, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifier in an internal combustion engine. 4,056,933, Cl. 60-278.000.
Nolan, Edward J.: *See*—
Ellingham, Walter; and Nolan, Edward J., 4,057,346, Cl. 355-41.000.
Norbeck, Dean K.: *See*—
Bauman, Bruce K.; Norbeck, Dean K.; and Tollinger, Donald L., 4,057,842, Cl. 361-93.000.
Nordberg, Krister: *See*—
Varis, Martti; and Nordberg, Krister, 4,057,076, Cl. 137-413.000.
Nordischer Maschinenbau Rud. Baader: *See*—
Wenzel, Werner, 4,056,866, Cl. 17-57.000.
Nordmark-Werke GmbH Hamburg: *See*—
Gutsche, Klaus; Kohlmann, Friedrich-Wilhelm; and Scharwachter, Peter, 4,057,545, Cl. 542-428.000.
Northern Telecom Limited: *See*—
DeBortoli, George; and Zimmermann, Detlef, 4,057,692, Cl. 179-98.000.
Norwalk-Turbo Inc.: *See*—
Pilarczyk, Karol, 4,057,371, Cl. 417-409.000.
Novanex Automation N. V.: *See*—
Laupman, Robert Ronald, 4,057,767, Cl. 330-207.00P.
Numata, Shigeaki; and Sasaoka, Ryosuke, to Matsushita Electric Industrial Co., Ltd. Electric blower assembly. 4,057,370, Cl. 417-366.000.
Nutron Corporation: *See*—
Denker, James M., 4,057,007, Cl. 91-501.000.
N.V. Chemische Fabriek "Naarden": *See*—
Boelens, Harmannus; Maessen, Jan Theodor Marie Francois; and van der Linde, Leendert Maarten, 4,057,515, Cl. 252-522.000.
N.V. Machinefabriek Terlet: *See*—
de Mos, Jacob Mink; and Koek, Pieter, 4,057,226, Cl. 366-244.000.
O'Brien, Catherine H., executrix: *See*—
O'Brien, Gerard J., deceased; and O'Brien, Catherine H., executrix, 4,057,688, Cl. 179-1.00H.
O'Brien, Gerard J., deceased; and by O'Brien, Catherine H., executrix. Intercom embodying tap transducers. 4,057,688, Cl. 179-1.00H.
Obuchi, Akio, to Pioneer Electronic Corporation. Speaker diaphragm having flat response curve. 4,057,694, Cl. 179-115.50R.
Oda, Kenji: *See*—
Ubukata, Susumu; Iyoda, Shozo; and Oda, Kenji, 4,057,200, Cl. 242-107.40A.
O'Donnell, James M., to Orgonics, Inc. Apparatus for treating sewage sludge. 4,057,392, Cl. 23-259.100.
Officine Meccaniche Danieli: *See*—
Danieli, Luigi, 4,057,099, Cl. 164-260.000.
"OFU" Ofenbau-Union GmbH: *See*—
Spessert, Robert, 4,057,233, Cl. 266-252.000.
Ogasa, Katsuhiro: *See*—
Okada, Katsuto; Ogasa, Katsuhiro; and Tomita, Mamoru, 4,057,655, Cl. 426-583.000.
Ogawa, Akira: *See*—
Sato, Akira; Ogawa, Akira; Hinata, Masanao; and Takei, Haruo, 4,057,430, Cl. 96-100.00R.
Ohmura, Takayoshi: *See*—
Habu, Teiji; Wada, Tsuneo; Sasaki, Takashi; Itoh, Shigemasa; Ohmura, Takayoshi; Ishii, Hiroki; and Yamaguchi, Hisashi, 4,057,538, Cl. 260-117.000.
Ohno, Ietatsu. Grinding method. 4,057,191, Cl. 241-30.000.
Ohno, Toru, to Hitachi, Ltd. Telecommunication system with controlled gain active filters. 4,057,695, Cl. 179-170.00R.

Ohnuma, Kiyoshi: *See—*
Kubo, Seitoku; Kuramochi, Kojiro; Morisawa, Kunio; and Ohnuma, Kiyoshi, 4,056,988, Cl. 74-695.000.
Ohsaka, Yonosuke: *See—*
Touzuka, Takashi; and Ohsaka, Yonosuke, 4,057,584, Cl. 260-593.00H.
Oka, Hiroyuki; and Ishihara, Masashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Brake control valve assembly for effecting increased rear braking action upon malfunction of the front system. 4,057,296, Cl. 303-6.00C.
Okabe, Akio: *See—*
Kinoshita, Mototaka; Okabe, Akio; and Ando, Susumu, 4,057,495, Cl. 210-44.000.
Okada, Humio: *See—*
Takamizawa, Minoru; Okada, Humio; Hasebe, Nobuyuki; and Toida, Hiromi, 4,057,596, Cl. 260-825.000.
Okada, Katsuto; Ogasa, Katsuhiro; and Tomita, Mamoru, to Morinaga Milk Industry Co., Ltd. Process for preparing a lactulose-containing powder for feed. 4,057,655, Cl. 426-583.000.
Okano, Takeo: *See—*
Kikuchi, Kiyoshi; Okano, Takeo; Terakawa, Yukio; and Nishihara, Akira, 4,057,525, Cl. 260-29.40R.
Okazima, Kenzo: *See—*
Suzuki, Kensei; Sanada, Takashi; and Okazima, Kenzo, 4,057,264, Cl. 280-276.000.
Oklahoma State University: *See—*
Reid, Karl N., Jr.; Ross, James Burr; and Murali, Beegamudre N., 4,057,059, Cl. 128-145.800.
Okuda, Kazumi. Diamond bearing microscopic certificate of appraisal. 4,056,952, Cl. 63-32.000.
Okuma Machinery Works Ltd.: *See—*
Ishida, Takashi, 4,056,900, Cl. 51-33.00W.
Olander, Harvey F., to Gustafson Mfg. Co. Apparatus for dispensing golf balls. 4,057,172, Cl. 221-10.000.
Oldenburg, Dorrance, to Caterpillar Tractor Co. Corrugated blade for tree harvester. 4,057,087, Cl. 144-34.00E.
Olin Corporation: *See—*
Evrard, Thomas O., 4,057,639, Cl. 424-270.000.
Gay, Walter A., 4,057,590, Cl. 260-646.000.
Olinkraft, Inc.: *See—*
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,056,913, Cl. 53-27.000.
Olympus Optical Co., Ltd.: *See—*
Matsubara, Masaki, 4,057,328, Cl. 350-214.000.
Ondrups, Leons: *See—*
Basil, Richard V., Jr.; Ondrups, Leons; and Shimizu, James K., 4,057,772, Cl. 333-83.00T.
Ong, Daniel; and Muller, Johannes Cornelius Antonius, to U.S. Philips Corporation. Electro-magnetically controllable beam deflection device. 4,057,331, Cl. 350-285.000.
Ono, Nobutaka, to Osaka Bobbin Kabushiki Kaisha. Method of dyeing wound up yarn. 4,056,860, Cl. 8-155.100.
Ono, Tetsuhiro; Aramaki, Minoru; Mizuno, Tamotsu; and Fujinaga, Masao, to Central Glass Company, Limited. Process for producing sodium fluoride from sodium silicofluoride. 4,057,614, Cl. 423-490.000.
Onufer, Joseph R.: *See—*
Furniss, William E.; Vancsa, George I.; and Onufer, Joseph R., 4,057,785, Cl. 340-163.000.
O'Rear, Jacques G.: *See—*
Griffith, James R.; and O'Rear, Jacques G., 4,057,569, Cl. 260-465.00E.
Orgonics, Inc.: *See—*
O'Donnell, James M., 4,057,392, Cl. 23-259.100.
Orth, Dieter: *See—*
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,057,647, Cl. 424-340.000.
Ortho Pharmaceutical Corporation: *See—*
Levine, Seymour; and Kane, Vinayak V., 4,057,547, Cl. 544-184.000.
Orton, Roger W. Portable flour mill. 4,057,194, Cl. 241-248.000.
Osaka Bobbin Kabushiki Kaisha: *See—*
Ono, Nobutaka, 4,056,860, Cl. 8-155.100.
Oscar Mayer & Co. Inc.: *See—*
Borsuk, Alvin; and Johnson, Charles H., 4,057,653, Cl. 426-513.000.
Otake, Tsutomu, to Kabushiki Kaisha Suwa Seikosha. Electro-chromic display driving circuit. 4,057,739, Cl. 307-270.000.
Otto Stuber KG: *See—*
Stuber, Wolfgang, 4,056,926, Cl. 57-81.000.
Ouchi, Hiromu: *See—*
Kawashima, Syunichiro; Nishida, Masamitsu; Matsuo, Yoshihiro; Ouchi, Hiromu; and Hayakawa, Shigeru, 4,057,324, Cl. 350-150.000.
Outhwaite, William C.: *See—*
Pashley, David H.; and Outhwaite, William C., 4,057,621, Cl. 424-49.000.
Overlach, Knud: *See—*
Pietzsch, Ludwig; Huhne, Gerd; Overlach, Knud; and Fuchs, Peter, 4,057,792, Cl. 340-267.00C.
Owen, Alan Ernest; and Mavor, John. Semiconductor device. 4,057,819, Cl. 357-23.000.
Owen, Hartley: *See—*
Gross, Benjamin; and Owen, Hartley, 4,057,397, Cl. 23-288.00B.
Owens-Corning Fiberglas Corporation: *See—*
Jones, Bernard H.; Cox, Daniel; and Gallagher, Don R., 4,057,195, Cl. 242-18.00G.
Owens-Illinois, Inc.: *See—*
Fillmore, William E.; Garver, Wayne E.; Mumford, George V.; and Price, James H., 4,057,159, Cl. 215-222.000.
Uhlig, Albert R., 4,057,609, Cl. 264-89.000.
Oy Finnlines Ltd.: *See—*
Pykala, Timo, 4,057,279, Cl. 294-93.000.
Ozaki, Toshihiko: *See—*
Hatori, Kunitake; Ozaki, Toshihiko; and Kondo, Ryohei, 4,057,171, Cl. 221-6.000.
Ozawa, Masahiro; Inoue, Fumio; Komatsu, Tadaaki; and Matsuoka, Kimiaki, to Central Glass Company, Limited. Process for preparing oligomers of tetrafluoroethylene. 4,057,591, Cl. 260-653.10R.
P. R. Mallory & Co. Inc.: *See—*
Dey, Arabinda N., 4,057,679, Cl. 429-194.000.
Paap, Hans J.; and Arnold, Dan M., to Texaco Inc. Behind casing fluid flow detection in producing wells using gas lift. 4,057,720, Cl. 250-266.000.
Pace, Joseph L., to Lawrence Peska Assoc. Wire stringing device. 4,056,859, Cl. 7-14.10R.
Pako Corporation: *See—*
Gaskell, Alfred J.; and Charnley, Ralph L., 4,057,818, Cl. 354-298.000.
Palka, Mike F. Outboard motor propeller guard. 4,057,028, Cl. 115-42.000.
Pammer, Erich; and Schnell, Friedrich, to Siemens Aktiengesellschaft. Semiconductor device and a method of producing such device. 4,057,659, Cl. 427-89.000.
Panning, Henry F.: *See—*
Creekmore, Mark D.; and Panning, Henry F., 4,057,672, Cl. 428-220.000.
Papenfuhs, Theodor: *See—*
Bachmann, Wilfried; Gnabs, Christian; Janecka, Kurt; Mundlos, Eberhard; Papenfuhs, Theodor; and Waese, Gerhard, 4,057,576, Cl. 260-525.000.
Park, Glenn S.; and Herpich, William A., to Peabody International Corporation. Load compacting and ejecting mechanism for a refuse truck. 4,057,157, Cl. 214-302.000.
Partsch, Ernest W. Absorption refrigerator. 4,056,947, Cl. 62-148.000.
Pashley, David H.; and Outhwaite, William C. Desensitizing oxalate dental composition and method of treatment. 4,057,621, Cl. 424-49.000.
Pasternak, Rudolf: *See—*
Kaimann, Walter; Pasternak, Rudolf; and Bauer, Jochen, 4,057,400, Cl. 48-77.000.
Patel, Jitendra G.; Schora, Frank C.; and Loeding, John W., to Institute of Gas Technology. Coal pretreatment and gasification process. 4,057,402, Cl. 48-197.00R.
Patel, Pramodbhai D., to Nitron Corporation/McDonnell-Douglas Corporation. Non-volatile semiconductor memory device. 4,057,821, Cl. 357-23.000.
Pattantyus-Abraham, Tamas I.; Vercellotti, Leonard C.; and South, William H., to Westinghouse Electric Corporation. Apparatus to measure the eccentricity of a shaft. 4,057,754, Cl. 324-207.000.
Pattyn, Herman Alberik: *See—*
De brabandere, Luc Achiel; Pollet, Robert Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, 4,057,429, Cl. 96-94.00R.
Paul, Alfred N.: *See—*
Fleming, George William; and Paul, Alfred N., 4,057,790, Cl. 340-224.000.
Paul, William Francis: *See—*
Kenigsberg, Irwin Jeffrey; and Paul, William Francis, 4,057,363, Cl. 416-145.000.
Paule, Kurt; Roll, Karl; and Burklin, Max, to Robert Bosch GmbH. Pneumatically powered hand tool with speed-control governor. 4,057,113, Cl. 173-12.000.
Payne, Joe R., to Keyes Fibre Company. Dual tongue and slot container lock. 4,057,169, Cl. 220-306.000.
Payton, Hugh W. Walking cast. 4,057,056, Cl. 128-83.500.
Peabody International Corporation: *See—*
Park, Glenn S.; and Herpich, William A., 4,057,157, Cl. 214-302.000.
Peake, Stephen Luther: *See—*
Montagna, Angelo Anthony; Somers, Allen Evarts; Peake, Stephen Luther; and Chun, Sun Woong, 4,057,488, Cl. 208-89.000.
Pearce, John Scott: *See—*
Pearce, Mary Ellen; and Pearce, John Scott, 4,056,897, Cl. 47-39.000.
Pearce, Mary Ellen; and Pearce, John Scott. Planter design and construction. 4,056,897, Cl. 47-39.000.
Peck, Walter R.: *See—*
Duncan, James W.; and Peck, Walter R., 4,057,206, Cl. 244-147.000.
Pelton, Raymond Lionel. Ball game with x-framed backstop. 4,057,252, Cl. 273-101.000.
Penick, Ib. Pocket sized camera. 4,057,813, Cl. 354-144.000.
Pennwalt Corporation: *See—*
Atkiss, Thomas Clifford; and Keen, William Elgin, Jr., 4,057,440, Cl. 148-6.15Z.
Graver, Clair Warren; Carwheel, Clarence Edward; and Bunczk, Charles Joseph, 4,057,503, Cl. 252-8.700.
Perrotta, Anthony J.: *See—*
Innes, Robert A.; and Perrotta, Anthony J., 4,057,570, Cl. 260-465.300.
Perry, Robert H.; and Miller, Howard N., to Westinghouse Electric Corporation. Train vehicle control apparatus. 4,057,753, Cl. 318-376.000.

Pesante, Domingo F. Collet stop and chuck assembly. 4,057,259, Cl. 279-1.00S.
Peschmann, Kristian; Junginger, Hans-Georg; and Hirsch, Hans-Jurgen, to U.S. Philips Corporation. X-ray exposure device comprising a gas-filled chamber. 4,057,728, Cl. 250-374.000.
Petersen, Hans Jorgen, to Leo Pharmaceutical Products Ltd. A/S. Antihypertensive pyridylguanidine compounds. 4,057,636, Cl. 424-263.000.
Petrolite Corporation: *See*—
Quinlan, Patrick M., 4,057,390, Cl. 21-2.70R.
Redmore, Derek; and Welge, Frederick T., 4,057,554, Cl. 260-296.00D.
Winslow, Joseph D., Jr., 4,056,968, Cl. 73-19.000.
Pews, R. Garth: *See*—
Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,057,517, Cl. 260-22.00R.
Pfau, Jean, to Ateliers des Charmilles S.A. Method of machining by erosive electrical discharges. 4,057,703, Cl. 219-69.00C.
Pfeifer, Josef: *See*—
Wick, Richard; Pfeifer, Josef; and Schnall, Gunther, 4,057,344, Cl. 355-16.000.
PFP-Anstalt Fuer Produkt-Entwicklung und Verwertung: *See*—
Fleischmann, Horst, 4,057,147, Cl. 211-47.000.
Pfuntner, Richard A.: *See*—
Hildebrand, George Lee; Sleeper, Thomas Till; Healey, William Allen; Hall, Stuart Jeffery; and Pfuntner, Richard A., 4,056,976, Cl. 73-231.00M.
Phillips, Kenneth G.; Ballweber, Edward G.; and Selvarajan, Radhakrishnan, to Nalco Chemical Company. Production of water-soluble polyamine condensate polymers having greater linear characteristics. 4,057,580, Cl. 260-567.60P.
Phillips Petroleum Company: *See*—
Moczygemba, George A., 4,057,601, Cl. 260-880.00B.
Seefluth, Charles L., 4,057,386, Cl. 425-526.000.
Pierce, Bill L.: *See*—
Thompson, Robert E.; and Pierce, Bill L., 4,057,465, Cl. 176-38.000.
Pierson, Joseph E.; and Stookey, Stanley D., to Corning Glass Works. Method for making photosensitive colored glasses. 4,057,408, Cl. 65-18.000.
Piesche, Helfried, to Bodenseewerk Perkin-Elmer & Co., GmbH. Thermal conductivity detector circuit. 4,057,755, Cl. 324-62.000.
Pietzsch, Ludwig; Huhne, Gerd; Overlach, Knud; and Fuchs, Peter, to Pietzsch, Ludwig. Overload safety device for telescopic cranes. 4,057,792, Cl. 340-267.00C.
Pigerol, Charles; de Cointet de Fillain, Paul; Nanthavong, Souli; and Le Blay, Jacques, to Labaz. 2-Phenyl-indole derivatives and process for preparing the same. 4,057,530, Cl. 260-45.80N.
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Werbenec, Jean-Pierre; and Broll, Madeleine, to Labaz. Active derivatives of methylamine in therapeutic compositions and methods of use. 4,057,644, Cl. 424-325.000.
Piguet, Christian, to Lasag S.A. Logic circuit for bistable D-dynamic flip-flops. 4,057,741, Cl. 307-279.000.
Pilarczyk, Karol, to Norwalk-Turbo Inc. Gas turbine driven high speed centrifugal compressor unit. 4,057,371, Cl. 417-409.000.
Pincherle, Hugh Andrew: *See*—
Holt, Ian; and Pincherle, Hugh Andrew, 4,056,881, Cl. 29-592.00R.
Ping, Ernest L.: *See*—
Jones, Richard F.; and Ping, Ernest L., 4,057,251, Cl. 273-95.00R.
Pinto, Adolf P. Engine having alternately rotating orbital pistons and cylinders. 4,057,039, Cl. 123-43.00B.
Pioneer Electronic Corporation: *See*—
Obuchi, Akio, 4,057,694, Cl. 179-115.50R.
Piotrowski, Eugene Gregory, to Worth Company, The. Anchor davit. 4,057,025, Cl. 114-210.000.
Piquard, Jean-Francois: *See*—
Dorffer, Auguste; and Piquard, Jean-Francois, 4,057,069, Cl. 128-421.000.
Pistorius, Rudolf, to Hoechst Aktiengesellschaft. Process for the manufacture of hydroquinone dimethyl ethers. 4,057,586, Cl. 260-613.00D.
Pkhakadze, Georgy Alexandrovich: *See*—
Lipatova, Tatyana Esperovna; Veselovsky, Roman Alexandrovich; and Pkhakadze, Georgy Alexandrovich, 4,057,535, Cl. 260-77.5AC.
Plastic Research Products, Inc.: *See*—
Horvath, William, 4,057,176, Cl. 222-193.000.
Platonov, Boris Pavlovich; Ryzhikov, Anton Abramovich; and Platonov, Jury Borisovich. Method of producing thin-walled castings. 4,057,098, Cl. 164-125.000.
Platonov, Jury Borisovich: *See*—
Platonov, Boris Pavlovich; Ryzhikov, Anton Abramovich; and Platonov, Jury Borisovich, 4,057,098, Cl. 164-125.000.
Plehnert, Kurt: *See*—
Mitterhummer, Gerhard; and Plehnert, Kurt, 4,057,459, Cl. 156-630.000.
PMS Consolidated: *See*—
Bradbury, William B.; Watts, Robert H.; and Scott, E. Timm, 4,057,193, Cl. 241-281.000.
Poirier, Robert A.: *See*—
Boretos, John W.; and Poirier, Robert A., 4,056,854, Cl. 3-1.500.
Polad, Michael: *See*—
Tramposch, Herbert; and Polad, Michael, 4,057,011, Cl. 101-93.030.
Polaroid Corporation: *See*—
Harrison, George C., 4,057,811, Cl. 354-33.000.
Johnson, Bruce K., 4,057,815, Cl. 354-288.000.
Killian, John C., Jr.; and Morse, John B., 4,057,816, Cl. 354-293.000.
Lambert, Ronald F.; and Rogers, Howard G., 4,057,425, Cl. 96-3.000.
Polizzano, Ida. Test clip. 4,057,313, Cl. 339-33.000.
Pollet, Robert Joseph: *See*—
De brabandere, Luc Achiel; Pollet, Robert Joseph; Pattyn, Herman Alberik; and Borginon, Hendrik Alfons, 4,057,429, Cl. 96-94.00R.
Poponiak, Michael Robert: *See*—
Burkhardt, Paul Johannes; and Poponiak, Michael Robert, 4,057,823, Cl. 357-52.000.
PPG Industries, Inc.: *See*—
Cunningham, Hugh; and Raetzsch, Carl W., 4,057,473, Cl. 204-98.000.
Michalik, Edmund R., 4,057,184, Cl. 225-2.000.
Reese, Thomas J., 4,057,411, Cl. 65-114.000.
Shoop, George W., 4,057,671, Cl. 428-208.000.
Prais, Alois G.: *See*—
Kaufman, Joseph; and Prais, Alois G., 4,057,052, Cl. 128-2.00F.
Preston, John M., to General Electric Company. Process for treating hydrophobic surfaces. 4,057,663, Cl. 427-307.000.
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., to Allied Chemical Corporation. Testing viscoelastic solids. 4,056,973, Cl. 73-91.000.
Price, James H.: *See*—
Fillmore, William E.; Garver, Wayne E.; Mumford, George V.; and Price, James H., 4,057,159, Cl. 215-222.000.
Pritscher, Karl: *See*—
Lechner, Gunther; Pritscher, Karl; and Kirschner, Helmut, 4,057,142, Cl. 206-332.000.
Procor Limited: *See*—
Deeks, Ronald George, 4,057,155, Cl. 214-83.280.
Procter & Gamble Company, The: *See*—
Lawrence, Benjamin, 4,057,652, Cl. 426-388.000.
Proebstle, Richard Alan: *See*—
Thompson, John Robert; Rowland, Trevor Cartwright; Proebstle, Richard Alan; Rosicky, Edward; and Snyder, Thoma Mees van't Hoff, 4,057,466, Cl. 176-38.000.
Prontor-Werk Alfred Gauthier GmbH: *See*—
Rentschler, Waldemar T.; Starp, Franz W. R.; and Helber, Karl, 4,057,812, Cl. 354-51.000.
Prot, Marcel G., to Mead Corporation, The. Method for manufacture of containers, particularly for packing purposes. 4,057,444, Cl. 156-69.000.
Prugnaud, Robert Louis, to Laboratoire Theranol. Therapeutic composition with marked polydetoxifying properties, especially with regard to tobacco. 4,057,620, Cl. 424-35.000.
Puddington, Ira E.: *See*—
Meadus, F. Weldon; Sparks, Bryan D.; Puddington, Ira E.; and Farnand, J. Redmond, 4,057,486, Cl. 208-11.0LE.
Pullman Incorporated: *See*—
Carr, George W., 4,057,273, Cl. 292-218.000.
Halliar, William R.; and Stark, Marvin, 4,057,020, Cl. 105-377.000.
Pusch, Gunter; and Gedenk, Rudolf, to Deutsche Texaco Aktiengesellschaft. Method of initiating underground in-situ combustion. 4,057,107, Cl. 166-260.000.
Pykala, Timo, to Oy Finnlines Ltd. Center lifting device. 4,057,279, Cl. 294-93.000.
Quantz, Reginald L. Convertible backpack and cot construction. 4,056,857, Cl. 5-112.000.
Quinlan, Patrick M., to Petrolite Corporation. Sulfur-containing bisquaternaries. 4,057,390, Cl. 21-2.70R.
R. A. Jones & Co. Inc.: *See*—
Hughes, Charles C., 4,057,008, Cl. 93-53.0BF.
Radt, Walter: *See*—
Bohnsack, Gerhard; Geffers, Hans; Kallfass, Herbert; and Radt, Walter, 4,057,511, Cl. 252-389.00A.
Raether, Wolfgang: *See*--
Winkelmann, Erhardt; Sinharay, Akhileswer; and Raether, Wolfgang, 4,057,634, Cl. 424-250.000.
Raetzsch, Carl W.: *See*—
Cunningham, Hugh; and Raetzsch, Carl W., 4,057,473, Cl. 204-98.000.
Rainville Company, Inc.: *See*—
Wunderlich, Ernst Dieter, 4,057,378, Cl. 425-137.000.
Rampton, Roger H. Tonal pitch indicator for a kettledrum. 4,056,998, Cl. 84-419.000.
Ramsey, Arthur Albert, to FMC Corporation. Nitroisothiazolylureas as herbicides. 4,057,415, Cl. 71-90.000.
Rank Organisation Limited, The: *See*—
Holt, Ian; and Pincherle, Hugh Andrew, 4,056,881, Cl. 29-592.00R.
Rao, Bhaskara M. L., to Exxon Research & Engineering Co. Method of preparing lithium-aluminum alloy electrodes. 4,056,885, Cl. 29-623.100.
Rao, Bhaskara M. L.; and Malachesky, Paul A., to Exxon Research & Engineering Co. Cell containing carbon-fluorine compound cathode, alkali metal anode and solid halo-aluminum alkali metal compound electrolyte. 4,057,676, Cl. 429-50.000.
Rasquin, Werner, to Felten & Guilleaume Carlswerk AG. Very-high-power-transmission cable system. 4,057,737, Cl. 307-147.000.
Rau, Allen E. Paper money crimping apparatus. 4,057,242, Cl. 271-3.000.
Rauma-Repola Oy: *See*—
Elonen, Kunto, 4,057,286, Cl. 296-43.000.
Kokkila, Kalevi, 4,057,213, Cl. 248-385.000.
Rauner, Lawrence A.; and Colquhoun, Joseph A., to Dow Corning Corporation. Method of modifying the physical properties of urethane elastomers. 4,057,595, Cl. 260-824.00R.

Rayburn, Billy R., to Rayburn, Billy R.; Mu, Paul T.; and Hayes, Alfred F. Sequential switching device. 4,056,891, Cl. 34-55.000.

Raymond Lee Organization Inc., The: *See—*
Girres, Gerard E., 4,057,254, Cl. 273-134.0CH.

Raytheon Company: *See—*
Collins, John D., 4,057,786, Cl. 365-76.000.
Sage, Jay P., 4,057,788, Cl. 365-174.000.

RCA Corporation: *See—*
Baker, Alfred Lynn, 4,057,826, Cl. 358-4.000.
Harbert, Donald Duane; and Ferrie, Ronald Gilbert, 4,057,761, Cl. 328-154.000.
Knop, Karl, 4,057,326, Cl. 350-162.00R.
Limberg, Allen LeRoy, 4,057,743, Cl. 307-296.00R.
Wheatley, Carl Franklin, Jr., 4,057,763, Cl. 330-288.000.
Woods, Murray Henderson, 4,057,824, Cl. 357-56.000.

Rediffusion Reditronics Limited: *See—*
Woolf, Lawrence Dudley, 4,057,769, Cl. 331-49.000.

Redmore, Derek; and Welge, Frederick T., to Petrolite Corporation. Quaternary ammonium salts of polyepihalohydrin. 4,057,554, Cl. 260-296.00D.

Reedhead, Frederick W.; Reedhead, Rowland E.; and Reynolds, George W. Tennis racket. 4,057,249, Cl. 273-73.00E.

Reedhead, Rowland E.: *See—*
Reedhead, Frederick W.; Reedhead, Rowland E.; and Reynolds, George W., 4,057,249, Cl. 273-73.00E.

Reese, Thomas J., to PPG Industries, Inc. Heat treating glass sheets on a roller hearth conveyor. 4,057,411, Cl. 65-114.000.

Regency Electronics, Inc.: *See—*
Koch, Richard C., 4,057,760, Cl. 325-455.000.

Regie Nationale des Usines Renault: *See—*
Colinet, Andre, 4,057,271, Cl. 292-87.000.

Reich, Steven Anthony, to Deere & Company. Hydraulic aneroid control and fluid flow restricting device for use therewith. 4,057,044, Cl. 123-140.0MP.

Reichel, Kurt; Decker, Gerd; Kuck, Alfred; and Schulz, Erwin, to Volkswagenwerk Aktiengesellschaft. Spark-ignited internal combustion engine operated with charge stratification. 4,057,037, Cl. 123-32.0SP.

Reichel, Kurt; Decker, Gerd; Kuck, Hans-Alfred; and Brandstetter, Walter, to Volkswagenwerk Aktiengesellschaft. Auxiliary combustion chamber for a stratified charge internal combustion engine. 4,057,038, Cl. 123-32.0SP.

Reichelt, Achim: *See—*
Mahlein, Hans; and Reichelt, Achim, 4,057,321, Cl. 350-96.0WG.

Reichelt, Karen Emalyn: *See—*
Berger, Julius; Reichelt, Karen Emalyn; and Schuep, Willy, 4,057,553, Cl. 260-295.00A.

Reichl, Alfred: *See—*
Ernst, Alfons; and Reichl, Alfred, 4,057,258, Cl. 277-12.000.

Reid, John; and Stiern, Walter W. Water saver. 4,056,856, Cl. 4-67.00A.

Reid, Karl N., Jr.; Ross, James Burr; and Murali, Beegamudre N., to Oklahoma State University. Intermittent positive pressure breathing device. 4,057,059, Cl. 128-145.800.

Reid, William Vincent. Clay centering device for a potter's wheel. 4,057,384, Cl. 425-459.000.

Reinshagen, Hellmuth: *See—*
Ascher, Gerd; and Reinshagen, Hellmuth, 4,057,557, Cl. 260-306.80R.

Reis, Robert D., to United Electric Controls Company. Density control monitor with opposing bellows. 4,057,699, Cl. 200-83.00D.

Rem Metals Corporation: *See—*
Brown, Robert A., 4,057,433, Cl. 106-38.300.

Renaud, Georges, to Societe Pompes Multiflux. Centrifugal pump. 4,057,361, Cl. 415-53.00R.

Renegar, Charles Gwin; and Colbeck, Frank Edward, to Hasbro Industries, Inc. Apparatus for trimming an extrudate. 4,057,456, Cl. 156-515.000.

Rentschler, Waldemar T.; Starp, Franz W. R.; and Helber, Karl, to Prontor-Werk Alfred Gauthier GmbH. Camera shutter having an electronic timing device. 4,057,812, Cl. 354-51.000.

REPA Feinstanzwerk GmbH: *See—*
Scibbe, Harold R.; and Smith, Edward J., 4,057,199, Cl. 242-107.700.

Resch, Alvin Charles, Jr., to American Hospital Supply Corporation. Gang luck assembly for cabinet drawers. 4,057,306, Cl. 312-218.000.

Reuter, Inc.: *See—*
Thompson, Vern C.; and Riggle, John A., 4,057,156, Cl. 214-302.000.

Reynolds, George W.: *See—*
Reedhead, Frederick W.; Reedhead, Rowland E.; and Reynolds, George W., 4,057,249, Cl. 273-73.00E.

Reynolds, Michael J.: *See—*
Leo, Thomas J.; Loser, Thomas N.; and Reynolds, Michael J., 4,057,529, Cl. 260-42.470.

Rhodes, Donald F., to Gulf Research & Development Company. Electrostatic charge reducer. 4,057,071, Cl. 137-1.000.

Rhone-Poulenc Industries: *See—*
Angleraud, Rene; and Ledru, Pierre, 4,057,518, Cl. 260-2.50N.
Antonini, Albert; Joffre, Philippe; and Laine, Francois, 4,057,592, Cl. 260-659.00A.

Rhone-Poulenc-Textile: *See—*
Fayolle, Bernard, 4,057,597, Cl. 260-860.000.

Rhone-Progil: *See—*
Asscher, Meir; and Rosin, Hadassa, 4,057,578, Cl. 260-543.00P.
Asscher, Meir; and Rosin, Hadassa, 4,057,579, Cl. 260-543.00P.

Richardson-Merrell Inc.: *See—*
Metzgar, Don P.; and Newhart, Raymond H., 4,057,626, Cl. 424-89.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,057,550, Cl. 260-293.550.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,057,551, Cl. 260-293.550.

Richter, Johan C. F.C., to Kamyr Aktiebolag. Method and apparatus for impregnation of fiber material by pressure pulsation. 4,057,461, Cl. 162-19.000.

Richter, Wolfgang: *See—*
Muschelknautz, Edgar; Burkholz, Armin; Wieschen, Hermann; Guth, Hans; and Richter, Wolfgang, 4,057,075, Cl. 137-171.000.

Richtzenhain, Hermann; and Janssen, Paul, deceased (by Janssen, Almuth, heir), to Lummus Company, The. Production of cyanopyridines from piperidines. 4,057,552, Cl. 260-294.900.

Ricoh Co., Ltd.: *See—*
Fujimoto, Sakae, 4,057,243, Cl. 271-256.000.
Muranaka, Masakazu; and Kato, Saburo, 4,057,256, Cl. 274-9.00C.

Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Eue, Ludwig, 4,057,418, Cl. 71-103.000.

Riggle, John A.: *See—*
Thompson, Vern C.; and Riggle, John A., 4,057,156, Cl. 214-302.000.

Riley, Michael O.: *See—*
Carter, Philip L.; Kim, Yung K.; and Riley, Michael O., 4,057,566, Cl. 260-448.20H.

Riner, Victor: *See—*
Juillard, Yves; and Riner, Victor, 4,057,083, Cl. 139-20.000.

Ring, Curtis Phillip, to Deere & Company. Dual flow hydraulic system and control valve therefor. 4,057,005, Cl. 91-413.000.

Rite Autotronics Corporation: *See—*
Schwartz, Edwin L., 4,057,520, Cl. 200-16.00D.

Rittler, Hermann L., to Corning Glass Works. Opaque infra-red transmitting glass-ceramic articles. 4,057,434, Cl. 106-39.700.

Ritzerfeld, Gerhard. Copying apparatus. 4,057,348, Cl. 355-75.000.

Robert Bosch GmbH: *See—*
Flaschar, Heinz; and Gand, Heinz, 4,057,216, Cl. 251-129.000.
Lammermann, Heinz, 4,056,876, Cl. 29-469.500.
Leisring, Herbert, 4,057,335, Cl. 352-188.000.
Paule, Kurt; Roll, Karl; and Burklin, Max, 4,057,113, Cl. 173-12.000.
Weyl, Helmut; and Steinke, Leo, 4,057,477, Cl. 204-195.00S.

Roberts, John A., to General Electric Company. Pneumatic system for a gas sensor. 4,056,967, Cl. 73-1.00G.

Robertshaw Controls Company: *See—*
Goodhouse, Carl J., 4,056,948, Cl. 62-155.000.

Robertson, Dean S., to Clark Equipment Company. Throttle holding device. 4,057,130, Cl. 192-3.00T.

Robin, Allen M.: *See—*
Crouch, William B.; Fabiero, Carolina P.; and Robin, Allen M., 4,057,510, Cl. 252-372.000.

Robot Research, Inc.: *See—*
Munsey, Clarence Jennings, 4,057,836, Cl. 358-140.000.

Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft mbH. Drawer guide. 4,057,303, Cl. 308-3.600.

Rock, John Denis: *See—*
Garnett, John Lyndon; and Rock, John Denis, 4,057,657, Cl. 427-44.000.

Roczek, Andrzej: *See—*
Chrobak, Eryk; Natkaniec, Benedykt; Wasyleczko, Zenon; Stawinski, Antoni; and Roczek, Andrzej, 4,056,929, Cl. 59-85.000.

Roemer, John F.: *See—*
Heuer, Dale A.; Roemer, John F.; and Sheehan, Michael J., 4,057,787, Cl. 365-104.000.

Roethlisberger, Jerry M., to General Motors Corporation. Front wheel drive and suspension arrangement. 4,057,120, Cl. 180-44.00R.

Rogers and Clarke Manufacturing Co.: *See—*
Clarke, Frederick W., 4,057,149, Cl. 214-1.0BV.

Rogers, Howard G.: *See—*
Lambert, Ronald F.; and Rogers, Howard G., 4,057,425, Cl. 96-3.000.

Rogers, Leslie Richard: *See—*
Davies, Peter Kingsley; Rogers, Leslie Richard; Stansfield, James Frederick; and Topham, Arthur, 4,057,436, Cl. 106-288.00Q.

Roll, Karl: *See—*
Paule, Kurt; Roll, Karl; and Burklin, Max, 4,057,113, Cl. 173-12.000.

Rollins, Eugene C. Exhaust pollution reduction apparatus for internal combustion engine carburetor. 4,057,604, Cl. 261-88.000.

Romagnolo, Gerard: *See—*
Cassard, Jacques; Lachenal, Jean-Michel; and Romagnolo, Gerard, 4,056,873, Cl. 29-132.000.

Roos, Ernst: *See—*
Wagner, Klaus; Eue, Ludwig; Schmidt, Robert R.; and Roos, Ernst, 4,057,419, Cl. 71-121.000.

Rosemount Inc.: *See—*
Danner, Kenneth H., 4,056,883, Cl. 29-611.000.

Rosenberger, Roy R., to Nalco Chemical Company. Mixing block for mixing polymers. 4,057,223, Cl. 366-172.000.

Rosicky, Edward: *See—*
Thompson, John Robert; Rowland, Trevor Cartwright; Proebstle, Richard Alan; Rosicky, Edward; and Snyder, Thoma Mees van't Hoff, 4,057,466, Cl. 176-38.000.

Rosin, Hadassa: *See*—
Asscher, Meir; and Rosin, Hadassa, 4,057,578, Cl. 260-543.00P.
Asscher, Meir; and Rosin, Hadassa, 4,057,579, Cl. 260-543.00P.
Rosin, Seymour: *See*—
Ehrenhaft, Franz F.; and Rosin, Seymour, 4,057,345, Cl. 355-35.000.
Ross, George P.; and Bedortha, James L., to National Steel Corporation. Press for separating molten metal from dross. 4,057,232, Cl. 266-227.000.
Ross, James Burr: *See*—
Reid, Karl N., Jr.; Ross, James Burr; and Murali, Beegamudre N., 4,057,059, Cl. 128-145.800.
Rossi, Alberto: *See*—
Haas, Georges; and Rossi, Alberto, 4,057,573, Cl. 560-52.000.
Rotex, Inc.: *See*—
Stasinski, David D.; and Lower, William E., 4,057,492, Cl. 209-366.500.
Roth, Richard C., to Block Drug Company, Inc. Disposable medicinal application apparatus. 4,057,060, Cl. 128-232.000.
Rothacker, Dietrich: *See*—
Schwuchow, Norbert; Burk, Gerhard; and Rothacker, Dietrich, 4,057,263, Cl. 280-106.00R.
Rottmann, Manfred, to F. Meyer & Schwabedissen GmbH & Co. KG. Apparatus for feeding strip material to glueing device. 4,057,197, Cl. 242-58.000.
Rovner, Philip Lee. Reed holding device for musical instruments. 4,056,997, Cl. 84-383.00R.
Rowland, Trevor Cartwright: *See*—
Thompson, John Robert; Rowland, Trevor Cartwright; Proebstle, Richard Alan; Rosicky, Edward; and Snyder, Thoma Mees van't Hoff, 4,057,466, Cl. 176-38.000.
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Ruckel, Erwin Richard; and Wang, Long Shyong, to Arizona Chemical Company. Polymerization of α-pinene. 4,057,682, Cl. 526-190.000.
Rufer, Clemens: *See*—
Biere, Helmut; Ahrens, Hanns; Rufer, Clemens; Schroder, Eberhard; and Koch, Henning, 4,057,640, Cl. 424-274.000.
Ruka, Roswell J.; and Charles, Robert G., to Westinghouse Electric Corporation. Heat sink. 4,057,101, Cl. 165-1.000.
Ruppert, Richard L.: *See*—
Case, James E.; and Ruppert, Richard L., 4,056,912, Cl. 52-745.000.
Russell, John Raymond: *See*—
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Rybakov, Ivan Alexandrovich: *See*—
Kudryavtsev, Alexandr Alexandrovich; Firsov, Vitaly Mikhailovich; Solinov, Evgeny Fedorovich; Symon, Mark Klavdievich; Litvinov, Pavel Ivanovich; Veresov, Albert Pavlovich; Rybakov, Ivan Alexandrovich; Trishin, Viktor Timofeevich; Goryannikov, Vladimir Mikhailovich; Savin, Vyacheslav Pavlovich; and Kashkarov, Igor Georgievich, 4,057,409, Cl. 65-154.000.
Ryzhikov, Anton Abramovich: *See*—
Platonov, Boris Pavlovich; Ryzhikov, Anton Abramovich; and Platonov, Jury Borisovich, 4,057,098, Cl. 164-125.000.
S & C Electric Company: *See*—
Biller, Bruce A., 4,057,775, Cl. 337-186.000.
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Bigi, Emanuele, 4,057,407, Cl. 62-22.000.
Saferstein, Lowell; and Stackman, Robert W., to Celanese Corporation. Self-extinguishing, non-dripping, phenolphthalein polyester molding compositions. 4,057,532, Cl. 260-47.00C.
Sage, Jay P., to Raytheon Company. Semiconductor memory structures. 4,057,788, Cl. 365-174.000.
St. Denis, Andrew Raoul: *See*—
Mette, Klaus Hermann; and St. Denis, Andrew Raoul, 4,057,713, Cl. 364-476.000.
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Nakatsuka, Ryuzo; Saito, Kenji; and Kawamoto, Tadashi, 4,057,674, Cl. 428-481.000.
Saito, Tadashi: *See*—
Sakai, Toshimitsu; Fukumura, Kagenori; and Saito, Tadashi, 4,056,991, Cl. 74-863.000.
Sakai, Makoto, to Kabushiki Kaisha Keihinseiki Seisakusho. Icing preventing device for a carburetor for two-cycle engine use. 4,057,041, Cl. 123-73.0AD.
Sakai, Toshimitsu; Fukumura, Kagenori; and Saito, Tadashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control device for use with automatic speed change gear device. 4,056,991, Cl. 74-863.000.
Sakakibara, Yasuyuki; and Kuno, Akira, to Nippon Soken, Inc. Method and apparatus for displaying brake stopping distance of a vehicle. 4,057,712, Cl. 364-426.200.
Sakaue, Tadashi: *See*—
Narita, Kazutoyo; Sakaue, Tadashi; and Niino, Yuzi, 4,057,825, Cl. 357-81.000.
Sakurazawa, Hatuo. Apparatus and method for noodle rolling. 4,057,377, Cl. 425-135.000.
Saletta, Gary F.: *See*—
Elms, Robert T.; Engel, Joseph C.; and Saletta, Gary F., 4,057,750, Cl. 315-86.000.
Saligny, Yves, to Etablissements Carpano & Pons SA. Cable connection units and protection devices. 4,057,843, Cl. 361-104.000.
Salmon, Sydney E.; and Liu, Rosa H., to University Patents, Inc. Radioiodinated bleomycin. 4,057,618, Cl. 424-1.000.
Salzgitter Maschinen AG: *See*—
Mausolf, Georg; Bellenbaum, Herbert; and Dietrich, Josef, 4,057,139, Cl. 198-509.000.
Samardjiev, Boris Krestanov: *See*—
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Sanada, Takashi: *See*—
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Sanbuichi, Hiroshi: *See*—
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Sanders Associates, Inc.: *See*—
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Harrington, Francis E.; and Ho, Robert S., 4,057,646, Cl. 424-331.000.
Sandoz Ltd.: *See*—
Ascher, Gerd; and Reinshagen, Hellmuth, 4,057,557, Cl. 260-306.80R.
Bormann, Gerhard; and Troxler, Franz, 4,057,560, Cl. 260-326.860.
Sankyo Electric Company Limited: *See*—
Hatori, Kunitake; Ozaki, Toshihiko; and Kondo, Ryohei, 4,057,171, Cl. 221-6.000.
Sargent Industries, Inc.: *See*—
MacDonald, Peter S., 4,057,217, Cl. 251-308.000.
Sarid, Dror; and Springett, Brian E., to Xerox Corporation. Compact corona charging device. 4,057,723, Cl. 250-326.000.
Sarstedt, Walter. Devices for extracting blood. 4,057,050, Cl. 128-2.00F.
Sasaki, Hiroshi: *See*—
Kinuhata, Koji; Amano, Kitsutaro; Sasaki, Hiroshi; and Yamamoto, Hideo, 4,057,835, Cl. 358-140.000.
Sasaki, Takashi: *See*—
Habu, Teiji; Wada, Tsuneo; Sasaki, Takashi; Itoh, Shigemasa; Ohmura, Takayoshi; Ishii, Hiroki; and Yamaguchi, Hisashi, 4,057,538, Cl. 260-117.000.
Sasaki, Tohru: *See*—
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Sasaoka, Ryosuke: *See*—
Numata, Shigeaki; and Sasaoka, Ryosuke, 4,057,370, Cl. 417-366.000.
Sasse, Klaus: *See*—
Naumann, Klaus; Lurssen, Klaus; Sasse, Klaus; Holtschmidt, Ulrich; and Schwarzmann, Gunter, 4,057,413, Cl. 71-76.000.
Sato, Akira; Ogawa, Akira; Hinata, Masanao; and Takei, Haruo, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,057,430, Cl. 96-100.00R.
Sato Iron Works Co., Ltd.: *See*—
Sato, Takuya, 4,057,379, Cl. 425-199.000.
Sato, Masato: *See*—
Toriya, Jun; Sato, Masato; Shiraga, Ken; and Matsunaga, Setsuo, 4,057,472, Cl. 203-80.000.
Sato, Takuya, to Sato Iron Works Co., Ltd. Kneading and extruding apparatus for extrudable material. 4,057,379, Cl. 425-199.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Constant pressure mechanism for hand labeler. 4,057,452, Cl. 156-384.000.
Savin, Vyacheslav Pavlovich: *See*—
Kudryavtsev, Alexandr Alexandrovich; Firsov, Vitaly Mikhailovich; Solinov, Evgeny Fedorovich; Symon, Mark Klavdievich; Litvinov, Pavel Ivanovich; Veresov, Albert Pavlovich; Rybakov, Ivan Alexandrovich; Trishin, Viktor Timofeevich; Goryannikov, Vladimir Mikhailovich; Savin, Vyacheslav Pavlovich; and Kashkarov, Igor Georgievich, 4,057,409, Cl. 65-154.000.
Saxena, Arjun N.; and Hart, Courtney, to Data General Corporation. Plasma etching process. 4,057,460, Cl. 156-643.000.
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Widart, Jean E. L.; and Scailteur, Alain F. C., 4,057,163, Cl. 220-3.000.
Scaros, Mike G.: *See*—
Dryden, Hugh L., Jr.; Scaros, Mike G.; and Telinski, Thomas J., 4,057,542, Cl. 260-239.55C.
Schaar, Lothar, to Heye, Hermann. Forming station for a machine for forming hollow articles of vitreous material. 4,057,412, Cl. 65-229.000.
Schabert, Hans-Peter; and Laurer, Erwin, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor steam generator installation. 4,057,077, Cl. 137-861.000.
Schabert, Hans-Peter: *See*—
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Schacht, Erich: *See*—
Gante, Joachim; Kurmeier, Hans-Adolf; Orth, Dieter; Schacht, Erich; and Wild, Albrecht, 4,057,647, Cl. 424-340.000.
Schaefer, Nick Lewis: *See*—
Gross, Donald Ralph; Schaefer, Nick Lewis; Russell, John Raymond; and Johnson, Clifford Ray, 4,057,088, Cl. 144-91.000.
Schaffluetzel, Paul: *See*—
Defago, Raymond; Schaffluetzel, Paul; Lapple, Arnulf Ruediger; and Hugelin, Bernard, 4,057,388, Cl. 8-2.50A.
Scharwachter, Peter: *See*—
Gutsche, Klaus; Kohlmann, Friedrich-Wilhelm; and Scharwachter, Peter, 4,057,545, Cl. 542-428.000.
Scheerhorn, Douglas, to Steelcase Inc. Locking system linkage adjustment. 4,057,307, Cl. 312-219.000.
Scheidler, Herwig, to JENAer Glaswerk Schott & Gen. Cooking

surfaces of glass-ceramic plates with layers with different values for radiation transmission. 4,057,670, Cl. 428-189.000.

Scherbatskoy, Serge A. Well bore communication method. 4,057,781, Cl. 340-18.0LD.

Schering Aktiengesellschaft: *See—*
Biere, Helmut; Ahrens, Hanns; Rufer, Clemens; Schroder, Eberhard; and Koch, Henning, 4,057,640, Cl. 424-274.000.
Weber, Alfred; Muller, Rudolf; and Kurzidim, Johannes, 4,057,541, Cl. 260-239.55A.

Schilte, Hank John. Sealing machines. 4,056,922, Cl. 53-373.000.

Schindl, Klaus P., to C. Reichert Optische Werke. Microscope eye piece focusing apparatus for use in producing sharp photographs. 4,057,318, Cl. 350-19.000.

Schlaf, Thomas Fulton, to Du Pont de Nemours, E. I., and Company. Benzothiazole allophanate fungicides. 4,057,638, Cl. 424-270.000.

Schlegel Corporation: *See—*
Metzler, Jay C., 4,057,668, Cl. 428-85.000.

Schlegel (U.K.) Limited: *See—*
Bernardo, Gerald; and Jackson, Richard Malcolm Clive, 4,056,909, Cl. 52-396.000.

Schlichting, John; and Tornow, Robert Norman, to Babcock & Wilcox Company, The. Industrial technique. 4,057,033, Cl. 122-32.000.

Schmidt, Dietrich; Huber, Karl Erwin; and Hofer, Johann, to Wacker-Chemitronic Gesellschaft fur Elektronik Grundstoffe mbH. Process for determining the donor content of polycrystalline silicon of high purity to be used in the semiconductor industries. 4,057,395, Cl. 23-230.00R.

Schmidt, Hans-Joachim, to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH. Frequency-response corrective network. 4,057,771, Cl. 333-70.00R.

Schmidt, Robert R.: *See—*
Wagner, Klaus; Eue, Ludwig; Schmidt, Robert R.; and Roos, Ernst, 4,057,419, Cl. 71-121.000.

Schmidt, Robert Rudolf: *See—*
Dickore, Karlfried; Eue, Ludwig; and Schmidt, Robert Rudolf, 4,057,417, Cl. 71-93.000.

Schnacke, Arthur W.: *See—*
Bond, James A.; Eckard, Spurgeon E.; and Schnacke, Arthur W., 4,056,946, Cl. 62-121.000.

Schnall, Gunther: *See—*
Wick, Richard; Pfeifer, Josef; and Schnall, Gunther, 4,057,344, Cl. 355-16.000.

Schnell, Friedrich: *See—*
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Scholz, Berthold: *See—*
Muller, Eckart; Simo, Thomas; Markwort, Helmut; and Scholz, Berthold, 4,057,224, Cl. 366-336.000.

Schoppe, Fritz. Combustion of pulverized coal. 4,057,021, Cl. 110-28.00A.

Schora, Frank C.: *See—*
Patel, Jitendra G.; Schora, Frank C.; and Loeding, John W., 4,057,402, Cl. 48-197.00R.

Schrader, Gustav E., to TRW Inc. Method of forming a plurality of articles. 4,057,475, Cl. 204-129.100.

Schraga, Irwin: *See—*
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Schramm, Siegfried: *See—*
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Schroder, Eberhard: *See—*
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Schroder, Rolf: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; and Eue, Ludwig, 4,057,418, Cl. 71-103.000.

Schrot, Joseph R., to Biospherics Incorporated. Use of radioisotopes for rapid identification of microorganisms. 4,057,470, Cl. 195-127.000.

Schubert, Dale W., to Barry Wright Corporation. Fluidic vibration isolator. 4,057,212, Cl. 248-358.00R.

Schuep, Willy: *See—*
Berger, Julius; Reichelt, Karen Emalyn; and Schuep, Willy, 4,057,553, Cl. 260-295.00A.

Schuermann, Josef H., to Texas Instruments Deutschland GmbH. Variable amplifier for RF input stage. 4,057,765, Cl. 330-279.000.

Schulz, Erwin: *See—*
Reichel, Kurt; Decker, Gerd; Kuck, Alfred; and Schulz, Erwin, 4,057,037, Cl. 123-32.0SP.

Schussler, Karl-Heinz: *See—*
Brucher, Eberhard; and Schussler, Karl-Heinz, 4,057,234, Cl. 266-272.000.

Schuster, Samuel J. High strength bag for storing materials in sterile condition. 4,057,144, Cl. 206-439.000.

Schwab, John A.: *See—*
Farquhar, Norman G.; and Schwab, John A., 4,057,034, Cl. 122-382.000.

Schwaebel, Rudolf, to Maschinenfabrik Augsburg-Nurnberg AG. Apparatus for raising the dynamic performance limit of steam flow and gas flow turbines and compressors. 4,057,362, Cl. 415-170.00R.

Schwartz, Edwin L., to Rite Autotronics Corporation. Slide switch assembly having flexible housing with movable contacts mounted on printed circuit board. 4,057,520, Cl. 200-16.00D.

Schwartz, Robert T.; and Harrison, Marc S., to American National Red Cross. Stackable wheeled chair. 4,057,288, Cl. 297-239.000.

Schwarz, Hans-Helmut: *See—*
Krall, Hermann-Dieter; Weissel, Oskar; and Schwarz, Hans-Helmut, 4,057,581, Cl. 260-571.000.

Schwarzmann, Gunter: *See—*
Naumann, Klaus; Lurssen, Klaus; Sasse, Klaus; Holtschmidt, Ulrich; and Schwarzmann, Gunter, 4,057,413, Cl. 71-76.000.

Schwing, Friedrich, to Friedrich Wilhelm Schwing GmbH. Multi-cylinder pump for concrete. 4,057,373, Cl. 417-519.000.

Schwuchow, Norbert; Burk, Gerhard; and Rothacker, Dietrich, to Daimler-Benz Aktiengesellschaft. Vehicle frame. 4,057,263, Cl. 280-106.00R.

Sciaky Vitry, S. A.: *See—*
Dumonte, Paul, deceased, 4,057,746, Cl. 313-237.000.

Scibbe, Harold R.; and Smith, Edward J., to REPA Feinstanzwerk GmbH. Tensionless retractor. 4,057,199, Cl. 242-107.700.

Scientific Instruments, Inc.: *See—*
Tucker, Thomas Lee; and Halverson, Gilbert, 4,056,887, Cl. 33-126.600.

Scott, E. Timm: *See—*
Bradbury, William B.; Watts, Robert H.; and Scott, E. Timm, 4,057,193, Cl. 241-281.000.

Scott Paper Company: *See—*
McConnell, Albert L., 4,057,669, Cl. 428-152.000.

Sebulsky, Raynor Tyler: *See—*
Montagna, Angelo Anthony; Somers, Allen Evarts; and Sebulsky, Raynor Tyler, 4,057,489, Cl. 208-89.000.

Seefluth, Charles L., to Phillips Petroleum Company. Means for controlling temperature of picker fingers to adjust parison alignment. 4,057,386, Cl. 425-526.000.

Seegers, Guenter, to WABCO Westinghouse GmbH. Safety valve device for multiple circuit fluid pressure operable brake system. 4,057,298, Cl. 303-84.00R.

Seidel, Heinz H., to GTE Sylvania Incorporated. Positive rake cutting insert for use in negative rake holders. 4,056,872, Cl. 407-114.000.

Seilly, Alec Harry, to Lucas Industries Limited. Electromagnetic devices. 4,057,744, Cl. 310-27.000.

Seissl, Johannes: *See—*
Hofmockel, Dieter; Grassme, Ulrich; Seissl, Johannes; and Fleer, Ernst Otto, 4,057,733, Cl. 250-491.000.

Seiter, Charles, to Infratab Corporation. Time-temperature indicator. 4,057,029, Cl. 116-114.00V.

Seki, Kenji: *See—*
Kimura, Akio; Seki, Kenji; Ukita, Mamoru; Asahi, Satoshi; and Tagami, Sanae, 4,057,600, Cl. 260-878.00B.

Sekine, Junzo: *See—*
Kimura, Goro; and Sekine, Junzo, 4,057,684, Cl. 536-4.000.

Sellstedt, John H.; and Klaubert, Dieter H., to American Home Products Corporation. Method of treatment using tetrazole-5-carboxamide derivatives. 4,057,632, Cl. 424-248.540.

Selvarajan, Radhakrishnan: *See—*
Phillips, Kenneth G.; Ballweber, Edward G.; and Selvarajan, Radhakrishnan, 4,057,580, Cl. 260-567.60P.

Seragnoli, Enzo, to G. D. Societa per Azioni. Compensating store device in systems for directly feeding cigarettes from cigarette manufacturing machine or machines to the hopper of the cigarette packeting machine. 4,056,915, Cl. 53-59.00R.

Seragnoli, Enzo, to G. D. Societa per Azioni. Compensating store device in systems for directly feeding cigarettes from cigarette manufacturing machine or machines to the hopper of the cigarette packeting machine. 4,056,916, Cl. 53-59.00R.

Seragnoli, Enzo, to G. D. Societa per Azioni. System for transferring and storing cigarettes. 4,056,917, Cl. 53-59.00R.

Seybold, Frederick W. Rotary internal combustion engine with uniformly rotating pistons cooperating with reaction elements having a varying speed of rotation and oscillating motion. 4,057,374, Cl. 418-36.000.

Shafer, Donald E., to Honeywell Inc. Recording apparatus. 4,057,808, Cl. 346-107.00R.

Shaffer, Walter M., to Caterpillar Tractor Co. Vehicle drive. 4,056,989, Cl. 74-745.000.

Shaffer, Walter M., to Caterpillar Tractor Co. Self-contained steering guidance means. 4,057,019, Cl. 104-247.000.

Shamp, Donald E.: *See—*
Daman, Lloyd W.; Marti, Don V., II; Mason, Freddie; and Shamp, Donald E., 4,057,410, Cl. 65-65.00A.

Shapiro, Howard E.: *See—*
Merz, Kenneth M.; and Shapiro, Howard E., 4,057,777, Cl. 338-309.000.

Sharma, Raj K.: *See—*
Prevorsek, Dusan C.; Kwon, Young D.; and Sharma, Raj K., 4,056,973, Cl. 73-91.000.

Sharp Kabushiki Kaisha: *See—*
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Shaw, Graham C.; Lawton, Emil A.; and Jones, Leon L., to Thiokol Corporation. Method of disposal of pyrotechnic compositions. 4,057,442, Cl. 149-109.400.

Sheehan, Michael J.: *See—*
Heuer, Dale A.; Roemer, John F.; and Sheehan, Michael J., 4,057,787, Cl. 365-104.000.

Shell Oil Company: *See—*
Broussard, Leo P., 4,057,108, Cl. 166-314.000.

Shen, Tsung-Ying; Jones, Howard; Mulvey, Dennis M.; and Dorn, Conrad F., to Merck & Co., Inc. 5-Mercaptopyridoxine esters. 4,057,637, Cl. 424-263.000.

Shen, Tsung-Ying: *See—*
Jones, Howard; and Shen, Tsung-Ying, 4,057,642, Cl. 424-304.000.

Shepherd, Gordon R.: *See*—
Slama, Jerry L.; Francis, David J.; and Shepherd, Gordon R., 4,057,185, Cl. 226-1.000.
Sherman, Henry B. Internal combustion turbine. 4,056,930, Cl. 60-39.780.
Sherwood, William G.: *See*—
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Shibasaki, Tadashi; and Ieda, Tsuguo, to Sumitomo Light Metal Industries, Ltd. Apparatus for metal extrusion. 4,056,964, Cl. 72-273.000.
Shields, Walter A. Loading apparatus. 4,056,920, Cl. 53-142.000.
Shiga, Michio; Hirano, Kimitoshi; and Matsushita, Matsuo, to Karonite Chemical Co., Ltd. Method of preparing overbased lubricating oil additives. 4,057,504, Cl. 252-33.000.
Shihabi, Marwan S., to International Telephone and Telegraph Corporation. Vapor recovery system. 4,057,085, Cl. 141-59.000.
Shimizu, James K.: *See*—
Basil, Richard V., Jr.; Ondrups, Leons; and Shimizu, James K., 4,057,772, Cl. 333-83.00T.
Shimizu, Shigemitu: *See*—
Miyamoto, Osamu; Iizaka, Isao; Yamamoto, Toshio; Hikosaka, Takashi; and Shimizu, Shigemitu, 4,057,339, Cl. 355-3.00R.
Shinetsu Chemical Company: *See*—
Takamizawa, Minoru; Okada, Humio; Hasebe, Nobuyuki; and Toida, Hiromi, 4,057,596, Cl. 260-825.000.
Shinoda, Nobuhiko: *See*—
Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,057,809, Cl. 354-23.00D.
Shiraga, Ken: *See*—
Toriya, Jun; Sato, Masato; Shiraga, Ken; and Matsunaga, Setsuo, 4,057,472, Cl. 203-80.000.
Shoemaker, Lloyd L., to Lloyd's Furnaces. Forced air hot water furnace. 4,057,189, Cl. 237-17.000.
Shoop, George W., to PPG Industries, Inc. Heated laminated window and method of assembling same. 4,057,671, Cl. 428-208.000.
Showa Denko Kabushiki Kaisha: *See*—
Hashimoto, Akihiro; Hayashi, Shigeo; Yamamoto, Sadao; and Chujo, Hitoshi, 4,057,608, Cl. 264-42.000.
Yamazaki, Isamu; Toyama, Yoichi; Hirota, Kiwami; and Takeuchi, Hisashi, 4,057,680, Cl. 526-142.000.
Shuck, Lowell Z., to United States of America, Energy Research and Development Administration. Method for describing fractures in subterranean earth formations. 4,057,780, Cl. 340-15.5MC.
Sicard, Hubert, to Compagnie Maritime d'Expertises - Comex. Disconnectable pipe union and device for manoeuvring same. 4,057,268, Cl. 285-31.000.
Siemens Aktiengesellschaft: *See*—
Balling, Heinz, 4,057,368, Cl. 417-313.000.
Hieke, Eduard, 4,057,722, Cl. 250-311.000.
Hofmockel, Dieter; Grassme, Ulrich; Seissl, Johannes; and Fleer, Ernst Otto, 4,057,733, Cl. 250-491.000.
Mahlein, Hans; and Reichelt, Achim, 4,057,321, Cl. 350-96.0WG.
Mair, Georg; and Schabert, Hans-Peter, 4,057,464, Cl. 176-37.000.
Mitterhummer, Gerhard; and Plehnert, Kurt, 4,057,459, Cl. 156-630.000.
Pammer, Erich; and Schnell, Friedrich, 4,057,659, Cl. 427-89.000.
Vogelsberg, Dieter, 4,056,925, Cl. 57-34.0AT.
Siempelkamp Giesserei KG: *See*—
Gross, Heiko, 4,057,162, Cl. 220-3.000.
Sigott, Siegfried, to Vereinigte Osterreichische Eisen-und Stahlwerke. Device for connecting the bits with the cutting head of a drift advancing machine or the like. 4,057,260, Cl. 279-77.000.
Sih, Charles J.; and Heather, James B., to Wisconsin Alumni Research Foundation. Chiral 2-substituted-4-hydroxy-2-cyclopenten-1-one. 4,057,851, Cl. 560-121.000.
Simes Societa Italiana Medicinali e Sintetici S.p.A.: *See*—
Ferrari, Giorgio; and Krepinsky, Jiri Jan, 4,057,635, Cl. 424-261.000.
Simmons, Gerald P.: *See*—
Brubaker, Hiram A.; Simmons, Gerald P.; and Streight, William E., 4,057,332, Cl. 350-319.000.
Simo, Thomas: *See*—
Muller, Eckart; Simo, Thomas; Markwort, Helmut; and Scholz, Berthold, 4,057,224, Cl. 366-336.000.
Simonbuild Limited: *See*—
Thorpe, Walter, 4,056,905, Cl. 52-223.00R.
Sinclair, Richard G., to Gulf Oil Corporation. Copolymers of L-(−)-lactide and epsilon caprolactone. 4,057,537, Cl. 260-78.30R.
Singer Company, The: *See*—
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Slama, Jerry L.; Francis, David J.; and Shepherd, Gordon R., to Armco Steel Corporation. Method and means for operating a pair of pinch rolls. 4,057,185, Cl. 226-1.000.
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Smedley, Sean Anthony, to American Microsystems, Inc. MOS input protection structure. 4,057,844, Cl. 361-111.000.
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Smith, Gary D., to Mobile Auto Crushers Corporation of America. Vehicle mounted compactor apparatus. 4,057,010, Cl. 100-50.000.
Smith, Leward N., to Morbark Industries, Inc. Tree harvesting machine. 4,057,192, Cl. 241-92.000.
Smith, Michael W.; and Houck, Stanley J., to Goodyear Tire & Rubber Company, The. Mandrel for fabricating an air spring. 4,057,454, Cl. 156-401.000.
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Smith, Thomas. Car window screen. 4,057,094, Cl. 160-37.000.
Smith, Walton J. Wheat-germ product and its use. 4,057,654, Cl. 426-555.000.
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Hill, David Taylor, 4,057,630, Cl. 424-204.000.
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Sperry Rand Corporation: *See*—
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Lowell, William P.; and Jagunich, Douglas M., 4,057,847, Cl. 364-200.000.
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Spessert, Robert, to "OFU" Ofenbau-Union GmbH. Continuous furnace. 4,057,233, Cl. 266-252.000.
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Stasinski, David D.; and Lower, William E., to Rotex, Inc. Adjustment of motion of screening machine. 4,057,492, Cl. 209-366.500.
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Stedman, Robert N., to Caterpillar Tractor Co. Modular rear axle suspension and drive arrangement for trucks. 4,057,121, Cl. 180-56.000.
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Steinhardt, Dieter. Deep drawn plastic packing case with interlocking, hollow fastener projections. 4,057,188, Cl. 229-29.00M.
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Stellwagen, Jean-Henri, to Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal. Magnetic pulse type ignition distributor. 4,057,045, Cl. 123-146.50A.
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Stephens, Robert K., to Falk Corporation, The. Lubricant wiper. 4,057,126, Cl. 184-11.00R.
Stettler, Gene A. Collapsible easel for artists. 4,057,215, Cl. 248-460.000.
Stewart, Richard E., to Westinghouse Electric Corporation. Method for connecting dynamoelectric machine coils. 4,056,880, Cl. 29-596.000.
Stickl, Helmut Anton. Acne preparation for oral administration. 4,057,627, Cl. 424-92.000.
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Strycker, Stanley J., to Dow Chemical Company, The. Substituted phenoxyalkyl quaternary ammonium compounds as antiarrhythmic agents. 4,057,645, Cl. 424-329.000.
Stuber, Wolfgang, to Otto Stuber KG. Method and apparatus for detecting so-called moire effect during spinning. 4,056,926, Cl. 57-81.000.
Su, Cherng Yi. Internal combustion engines. 4,057,035, Cl. 123-8.270.
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Sumitomo Light Metal Industries, Ltd.: *See*—
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Suzuki, Manao, to Kyokado Engineering Co. Ltd. Method of consolidating soils. 4,056,937, Cl. 61-36.00B.
Suzuki, Shigeto, to Chevron Research Company. Process for preparing di(alkoxy-carboxy) hydrocarbylenes. 4,057,577, Cl. 260-535.00P.
Svensson, Lars David. Arrangement for supporting lighting fittings and the like. 4,057,718, Cl. 362-249.000.
Swanson, Rollan. Ore treatment process. 4,057,422, Cl. 75-86.000.
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Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,057,551, Cl. 260-293.550.
Szulewski, John W. Artificial tree structure. 4,057,665, Cl. 428-8.000.
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Hiromi, to Shinetsu Chemical Company. Anti-sticking silicone compositions of non-solvent type. 4,057,596, Cl. 260-825.000.
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Tani, Yoshio, to Kobe Steel, Ltd. Steel bar for concrete reinforcement having a non-circular cross-section. 4,056,911, Cl. 52-738.000.
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Tavernier, Georges Antoine, to Societe Nouvelle Baele Gangloff. Apparatus for transferring labels or like flexible sheets. 4,057,457, Cl. 156-571.000.
Taylor, Harry E. Catheter holder for securing a urethral catheter to a patient. 4,057,066, Cl. 128-349.00R.
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Theidel, Hans: *See—*
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Thomas, Charles S. Tape printer and stripper assembly. 4,057,014, Cl. 101-228.000.
Thomas, Geoffrey Owen, to United States of America, Navy. Mechanism for deep ocean instrumentation remote release. 4,057,000, Cl. 85-33.000.
Thompson, John Robert; Rowland, Trevor Cartwright; Proebstle, Richard Alan; Rosicky, Edward; and Snyder, Thoma Mees van't Hoff, to General Electric Company. Conditioning of nuclear reactor fuel. 4,057,466, Cl. 176-38.000.
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Thompson, Vern C.; and Riggle, John A., to Reuter, Inc. Lifting arm apparatus. 4,057,156, Cl. 214-302.000.
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Timmler, Helmut; and Draber, Wilfried, to Bayer Aktiengesellschaft. 4-Amino-1,2,4-triazin-5-ones. 4,057,546, Cl. 544-182.000.
Timron, Inc.: *See—*
Kessler, Theodore P., 4,057,143, Cl. 206-400.000.
Timsit, Claude, to Association pour le Developpement de l'Enseignement et de la Recherche en Systematique Appliquee (A.D.E.R.S.A.). Analog-to-digital encoder. 4,057,795, Cl. 340-347.0AD.
TIW Industries, Inc.: *See—*
Guarnere, Joseph V., 4,056,903, Cl. 52-122.000.
Tjurin, Albert Vasilievich: *See—*
Bataev, Mikhail Kirillovich; Veits, Isaak Efimovich; Gorodetsky, Sergei Sergeevich; Macheret, Lev Ilich; Kuznetsov, Lev Alexeevich; Tjurin, Albert Vasilievich; and Yaunzem, Jury Eduardovich, 4,057,453, Cl. 156-390.000.
Toida, Hiromi: *See—*
Takamizawa, Minoru; Okada, Humio; Hasebe, Nobuyuki; and Toida, Hiromi, 4,057,596, Cl. 260-825.000.
Tokura, Koichi: *See—*
Kaneda, Saburo; and Tokura, Koichi, 4,057,850, Cl. 364-200.000.
Tokyo Shibaura Electric Company, Ltd.: *See—*
Hamano, Eizaburo, 4,057,747, Cl. 313-413.000.
Tokyo Tanabe Company, Limited: *See—*
Kimura, Goro; and Sekine, Junzo, 4,057,684, Cl. 536-4.000.
Tol-O-Matic, Inc.: *See—*
Berg, David W., 4,057,257, Cl. 277-4.000.
Tollinger, Donald L.: *See—*
Bauman, Bruce K.; Norbeck, Dean K.; and Tollinger, Donald L., 4,057,842, Cl. 361-93.000.
Tomita, Mamoru: *See—*
Okada, Katsuto; Ogasa, Katsuhiro; and Tomita, Mamoru, 4,057,655, Cl. 426-583.000.
Tomy Kogyo Co., Inc.: *See—*
Karasawa, Hideyasu, 4,056,896, Cl. 46-132.000.
Topham, Arthur: *See—*
Davies, Peter Kingsley; Rogers, Leslie Richard; Stansfield, James Frederick; and Topham, Arthur, 4,057,436, Cl. 106-288.00Q.
Torii, Michihiro: *See—*
Kobayashi, Seihin; Torii, Michihiro; and Kobayashi, Hiroaki, 4,057,606, Cl. 264-24.000.
Toriya, Jun; Sato, Masato; Shiraga, Ken; and Matsunaga, Setsuo, to Haji, Noboru; and Mitsubishi Chemical Industries Ltd. Method of separating diacetoxybutene. 4,057,472, Cl. 203-80.000.
Tornow, Robert Norman: *See—*
Schlichting, John; and Tornow, Robert Norman, 4,057,033, Cl. 122-32.000.
Touzuka, Takashi; and Ohsaka, Yonosuke, to Daikin Kogyo Co., Ltd. Process for preparing hexafluoropropanone-2. 4,057,584, Cl. 260-593.00H.
Towmotor Corporation: *See—*
Artrip, Robert W.; and Klimo, Robert G., 4,057,752, Cl. 318-345.00B.
Towne Robinson Fastener Company: *See—*
Chaivre, Joseph W.; and Jadach, Albert A., 4,056,862, Cl. 10-72.00R.
Toyama, Yoichi: *See—*
Yamazaki, Isamu; Toyama, Yoichi; Hirota, Kiwami; and Takeuchi, Hisashi, 4,057,680, Cl. 526-142.000.
Toyo Kogyo Co., Ltd.: *See—*
Hatano, Mitsuru, 4,056,990, Cl. 74-781.00R.
Toyo Seikan Kaisha Ltd.: *See—*
Yamaguchi, Kanemichi, 4,057,391, Cl. 21-56.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Koshino, Kenji; and Itoh, Masayasu, 4,057,022, Cl. 113-120.00G.

Kubo, Seitoku; Kuramochi, Kojiro; Morisawa, Kunio; and Ohnuma, Kiyoshi, 4,056,988, Cl. 74-695.000.
Mizusawa, Shinichiro; Tamura, Chiharu; Nakamura, Norihiko; and Yanagihara, Hiromichi, 4,056,934, Cl. 60-311.000.
Nohira, Hidetaka; and Kobashi, Kiyoshi, 4,056,933, Cl. 60-278.000.
Oka, Hiroyuki; and Ishihara, Masashi, 4,057,296, Cl. 303-6.00C.
Sakai, Toshimitsu; Fukumura, Kagenori; and Saito, Tadashi, 4,056,991, Cl. 74-863.000.

Tracy, Frank R., to General Tire & Rubber Company, The. Pneumatic tire for use when deflated. 4,057,092, Cl. 152-379.100.

Tramposch, Herbert; and Polad, Michael, to Malco Plastics. Means for printing OCR and bar code on cards. 4,057,011, Cl. 101-93.030.

Tratz, Herbert; Kelp, Fritz; and Netsch, Erich, to Kraftwerk Union Aktiengesellschaft. Feedwater preheater with two steam chambers. 4,057,103, Cl. 165-11.000.

Trioliet-Mullos Silo Nederland B.V.: *See*—
Liet, Fredericus; and Liet, Cornelis Hendrikus, 4,057,295, Cl. 302-56.000.

Trishin, Viktor Timofeevich: *See*—
Kudryavtsev, Alexandr Alexandrovich; Firsov, Vitaly Mikhailovich; Solinov, Evgeny Fedorovich; Symon, Mark Klavdievich; Litvinov, Pavel Ivanovich; Veresov, Albert Pavlovich; Rybakov, Ivan Alexandrovich; Trishin, Viktor Timofeevich; Goryannikov, Vladimir Mikhailovich; Savin, Vyacheslav Pavlovich; and Kashkarov, Igor Georgievich, 4,057,409, Cl. 65-154.000.

Troxler, Franz: *See*—
Bormann, Gerhard; and Troxler, Franz, 4,057,560, Cl. 260-326.860.

Trudeau, William H.: *See*—
Gaines, Donald R.; Smallegan, Jon M.; and Trudeau, William H., 4,057,304, Cl. 308-237.00A.

Trujillo, John J. Measuring liquid dispenser with flat top. 4,057,174, Cl. 222-49.000.

Trus Joist Corporation: *See*—
Gross, Donald Ralph; Schaefer, Nick Lewis; Russell, John Raymond; and Johnson, Clifford Ray, 4,057,088, Cl. 144-91.000.

TRW Inc.: *See*—
Merz, Kenneth M.; and Shapiro, Howard E., 4,057,777, Cl. 338-309.000.
Schrader, Gustav E., 4,057,475, Cl. 204-129.100.

Tsukutani, Ko[illegible]hi: *See*—
Nakagawa, Yasuichi; Ikenishi, Masataka; Hozumi, Yoshio; Kushida, Shozo; and Tsukutani, Koichi, 4,057,698, Cl. 200-16.00A.

Tucker, Thomas Lee; and Halverson, Gilbert, to Scientific Instruments, Inc. Device for the measurement of liquid level. 4,056,887, Cl. 33-126.600.

Tuzinsky, Wolfgang: *See*—
Isenberg, Gerhard; and Tuzinsky, Wolfgang, 4,057,369, Cl. 417-365.000.

Tuzson, John J., to Borg-Warner Corporation. Slip speed responsive device for controlling engagement of fluid actuated clutch. 4,057,133, Cl. 192-103.00F.

Tylan Corporation: *See*—
LeMay, Dan B., 4,056,975, Cl. 73-202.000.

Ubukata, Susumu; Iyoda, Shozo; and Oda, Kenji, to Ubukata, Susumu. Emergency locking retractor for vehicle seat belts. 4,057,200, Cl. 242-107.40A.

Uetrecht, Dale M., to D. H. Baldwin Company. Single master tone generator. 4,056,995, Cl. 84-1.010.

Ugine Carbone: *See*—
Cassard, Jacques; Lachenal, Jean-Michel; and Romagnolo, Gerard, 4,056,873, Cl. 29-132.000.

Uhlig, Albert R., to Owens-Illinois, Inc. Method of making blown plastic articles. 4,057,609, Cl. 264-89.000.

Uhring, Gary S.: *See*—
Hood, Frederick E.; Mitchell, Donald K.; and Uhring, Gary S., 4,057,023, Cl. 114-107.000.

Ukita, Mamoru: *See*—
Kimura, Akio; Seki, Kenji; Ukita, Mamoru; Asahi, Satoshi; and Tagami, Sanae, 4,057,600, Cl. 260-878.00B.

Umiastowski, John. Yarn-twisting method and apparatus. 4,056,924, Cl. 57-5.000.

Underground Location Services Limited: *See*—
Jones, Trevor Clifford, 4,057,081, Cl. 138-97.000.

Ungerer geb. Dollinger, Irma: *See*—
Ihle, Josef, 4,056,994, Cl. 83-311.000.

Union Oil Company of California: *See*—
Klass, Donald L., 4,057,575, Cl. 560-245.000.

United Air Specialists, Inc.: *See*—
Cheney, William A.; and Spurgin, Wendell P., 4,057,405, Cl. 55-105.000.

United Electric Controls Company: *See*—
Reis, Robert D., 4,057,699, Cl. 200-83.00D.

United Kingdom Atomic Energy Authority: *See*—
Lunt, Anthony Randle, 4,057,468, Cl. 176-78.000.

United States of America
Army: *See*—
Donovan, William F., 4,057,002, Cl. 89-8.000.
Greendale, John H., 4,056,852, Cl. 2-417.000.
Energy Research and Development Administration: *See*—
Fischer, Harry C., 4,057,074, Cl. 137-107.000.
Jassby, Daniel L.; and Hooke, William M., 4,057,462, Cl. 176-5.000.
McDonald, Robert E.; and Canonico, Domenic A., 4,056,963, Cl. 72-253.00R.
Shuck, Lowell Z., 4,057,780, Cl. 340-15.5MC.
Walker, Robert D., Jr., 4,057,678, Cl. 429-104.000.
Health, Education and Welfare: *See*—
Boretos, John W.; and Poirier, Robert A., 4,056,854, Cl. 3-1.500.
Interior: *See*—
Blanz, John, 4,057,115, Cl. 173-160.000.
Bruckenstein, Stanley; and Sherwood, William G., 4,057,478, Cl. 204-195.00P.
Navy: *See*—
Bates, Albert M.; and Madera, Anthony J., 4,057,778, Cl. 340-2.000.
Coleman, Ernest W., 4,057,803, Cl. 343-113.00R.
Griffith, James R.; and O'Rear, Jacques G., 4,057,569, Cl. 260-465.00E.
Lewis, Adolph Lee, 4,057,719, Cl. 250-227.000.
Thomas, Geoffrey Owen, 4,057,000, Cl. 85-33.000.

U.S. Philips Corporation: *See*—
Braat, Josephus Johannes Maria, 4,057,833, Cl. 358-128.000.
Gieles, Antonius Cornelis Maria; and Somers, Gerardus Henricus Johannus, 4,057,063, Cl. 128-303.170.
Hoogendijk, Adrianus Huibert, 4,057,827, Cl. 358-8.000.
Hoogendoorn, Abraham; van de Grift, Robert Emile Johan; and van Kessel, Theodorus Jozef, 4,057,796, Cl. 340-347.0AD.
Jacobs, Bernardus Antonius Johannus; van der Wal, Johannes; and Gerritsen, Gerrit Berend, 4,057,831, Cl. 358-128.000.
Kappert, Hermanus Antonius, 4,057,832, Cl. 358-128.000.
Needs, Howard Curtis; and Spapens, Harald Henricus Cornelis Maria, 4,057,837, Cl. 358-254.000.
Ong, Daniel; and Muller, Johannes Cornelius Antonius, 4,057,331, Cl. 350-285.000.
Peschmann, Kristian; Junginger, Hans-Georg; and Hirsch, Hans-Jurgen, 4,057,728, Cl. 250-374.000.
Wagner, Wolfgang, 4,057,725, Cl. 250-360.000.

United Technologies Corporation: *See*—
Cruff, Carlton E.; and Day, Edward G., 4,057,227, Cl. 366-2.000.
Kenigsberg, Irwin Jeffrey; and Paul, William Francis, 4,057,363, Cl. 416-145.000.

University Patents, Inc.: *See*—
Salmon, Sydney E.; and Liu, Rosa H., 4,057,618, Cl. 424-1.000.

Upatnieks, Juris, to Environmental Research Institute of Michigan. Hologram projector. 4,057,317, Cl. 350-3.500.

Upjohn Company, The: *See*—
Axen, Udo F., 4,057,574, Cl. 560-53.000.
Coverdale, Charles E.; and Skaletzky, Louis L., 4,057,633, Cl. 424-250.000.
Lin, Chiu-Hong, 4,057,572, Cl. 560-53.000.
Youngdale, Gilbert A., 4,057,564, Cl. 260-410.90R.

Vadovic, Charles J.; Wesselhoft, Robert D.; and Nahas, Nicholas C., to Exxon Research & Engineering Co. Alkali metal catalyst recovery system. 4,057,512, Cl. 252-413.000.

Vagliani, Federico; and Molinari, Alcide, to Telettra Laboratori di Telefonia Elettronica e Radio S.p.A. Method and apparatus for detecting the presence of a speech signal on a voice channel signal. 4,057,690, Cl. 179-15.0AS.

Vahle, Erwin; and Tautz, Helmut, to Singer Company, The. Arm top cover for locking devices. 4,057,272, Cl. 292-128.000.

Valdes, A. R., to Fluor Corporation. Gas treating process. 4,057,403, Cl. 55-31.000.

Valentine, Jean A., to Martin Marietta Corporation. Endless carrier sleeve for discrete fragments. 4,057,001, Cl. 86-1.00R.

Valleylab, Inc.: *See*—
Morrison, Charles F., Jr.; and Weaver, Benson C., 4,057,064, Cl. 128-303.170.

van Amerongen, Evert; and Buhrman, Willem M., to SKF Industrial Trading and Development Company B.V. Cleaning apparatus for mechanical workpieces. 4,057,070, Cl. 134-83.000.

Vancsa, George I.: *See*—
Furniss, William E.; Vancsa, George I.; and Onufer, Joseph R., 4,057,785, Cl. 340-163.000.

van de Grift, Robert Emile Johan: *See*—
Hoogendoorn, Abraham; van de Grift, Robert Emile Johan; and van Kessel, Theodorus Jozef, 4,057,796, Cl. 340-347.0AD.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N. V. Soil cultivating machines. 4,057,111, Cl. 172-72.000.

van der Lely, Cornelis. Rotary harrows. 4,057,110, Cl. 172-49.000.

van der Linde, Leendert Maarten: *See*—
Boelens, Harmannus; Maessen, Jan Theodor Marie Francois; and van der Linde, Leendert Maarten, 4,057,515, Cl. 252-522.000.

van der Wal, Johannes: *See*—
Jacobs, Bernardus Antonius Johannus; van der Wal, Johannes; and Gerritsen, Gerrit Berend, 4,057,831, Cl. 358-128.000.

Van Gompel, James J., to Brammall, Inc. Method and apparatus for bracing and securing doors. 4,057,274, Cl. 292-259.00R.

van Kessel, Theodorus Jozef: *See*—
Hoogendoorn, Abraham; van de Grift, Robert Emile Johan; and van Kessel, Theodorus Jozef, 4,057,796, Cl. 340-347.0AD.

van Valkenburg, Howard E.; and McCarroll, Vincent P., to Automation Industries, Inc. Distance amplitude compensation system. 4,056,971, Cl. 73-629.000.

Variable Kinetic Drives, Ltd.: *See*—
Hobbs, Howard Frederick, 4,056,986, Cl. 74-688.000.

Varis, Martti; and Nordberg, Krister. Waste water valve. 4,057,076, Cl. 137-413.000.

Vavrik, Ernest: *See*—
Skrabak, Michal; Vavrik, Ernest; Kolarik, Stanislav; and Mazak, Milos, 4,057,497, Cl. 210-65.000.

Veits, Isaak Efimovich: *See*—
Bataev, Mikhail Kirillovich; Veits, Isaak Efimovich; Gorodetsky, Sergei Sergeevich; Macheret, Lev Ilich; Kuznetsov, Lev Alexeevich; Tjurin, Albert Vasilievich; and Yaunzem, Jury Eduardovich, 4,057,453, Cl. 156-390.000.

Vensel, Richard R. Aircraft with oxygen supply and method of supplying oxygen thereto. 4,057,205, Cl. 244-118.00P.

Vent-Cair, Inc.: *See*—
Kuechler, Irvin R., 4,056,877, Cl. 29-469.000.

Vercellotti, Leonard C.: *See*—
Pattantyus-Abraham, Tamas I.; Vercellotti, Leonard C.; and South, William H., 4,057,754, Cl. 324-207.000.

Vereinigte Aluminum-Werke Aktiengesellschaft: *See*—
Lossack, Edgar; Kramer, Kurt; and Bulian, Gerd, 4,057,100, Cl. 164-418.000.

Vereinigte Osterreichische Eisen-und Stahlwerke: *See*—
Sigott, Siegfried, 4,057,260, Cl. 279-77.000.

Veresov, Albert Pavlovich: *See*—
Kudryavtsev, Alexandr Alexandrovich; Firsov, Vitaly Mikhailovich; Solinov, Evgeny Fedorovich; Symon, Mark Klavdievich; Litvinov, Pavel Ivanovich; Veresov, Albert Pavlovich; Rybakov, Ivan Alexandrovich; Trishin, Viktor Timofeevich; Goryannikov, Vladimir Mikhailovich; Savin, Vyacheslav Pavlovich; and Kashkarov, Igor Georgievich, 4,057,409, Cl. 65-154.000.

Vernieres, Jean-Claude: *See*—
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Werbenec, Jean-Pierre; and Broll, Madeleine, 4,057,644, Cl. 424-325.000.

Vernon, Richard H.: *See*—
Fischbeck, Kenneth H.; and Vernon, Richard H., 4,057,807, Cl. 346-140.00R.

Vero Electronics Limited: *See*—
Hedger, Denyer Edward, 4,057,186, Cl. 226-127.000.

Veselovsky, Roman Alexandrovich: *See*—
Lipatova, Tatyana Esperovna; Veselovsky, Roman Alexandrovich; and Pkhakadze, Georgy Alexandrovich, 4,057,535, Cl. 260-77.5AC.

Vetco Offshore Industries, Inc.: *See*—
Jansen, Martin B., Jr., 4,057,267, Cl. 285-18.000.

Victor, George; Fisher, Robert G.; and Bischof, Kaspar, to E. & J. Gallo Winery. Self-retaining bottle stopper. 4,057,160, Cl. 215-318.000.

Vidilles, Jacques. Concentrators for recovering liquid pollutant floating on the surface of a sheet of water. 4,057,498, Cl. 210-170.000.

Vilums, Ivars J.: *See*—
Bimmerle, Charles F.; Braig, James R.; and Vilums, Ivars J., 4,057,791, Cl. 340-261.000.

Virginia National Bank: *See*—
Barnett, Larkin H., III, 4,056,889, Cl. 33-188.000.

Vogelsberg, Dieter, to Siemens Aktiengesellschaft. Method and apparatus for the SZ-twisting of electrical cables. 4,056,925, Cl. 57-34.0AT.

Volk & Son Manufacturing Co., Inc.: *See*—
Cloyd, John Keen, 4,056,865, Cl. 17-1.00S.

Volker, Martin; and Muhlhoff, Heinz, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Mixing of materials. 4,057,228, Cl. 366-79.000.

Volkswagenwerk Aktiengesellschaft: *See*—
Reichel, Kurt; Decker, Gerd; Kuck, Alfred; and Schulz, Erwin, 4,057,037, Cl. 123-32.0SP.
Reichel, Kurt; Decker, Gerd; Kuck, Hans-Alfred; and Brandstetter, Walter, 4,057,038, Cl. 123-32.0SP.

Vostrowsky, Otto: *See*—
Bestmann, Hans Jurgen; Stransky, Werner Theo; and Vostrowsky, Otto, 4,057,593, Cl. 260-682.000.

Vrba, Richard Alan: *See*—
Cockerill, William Clyde; Hornung, Louis Michael; Johnson, Donavon William; and Vrba, Richard Alan, 4,057,846, Cl. 364-200.000.

Vsesoiuzny Proektno-Izyskatelsky Nauchno-Issledovatelsky Institut "Gidroproek" Imeni S. Ya. Zhuka: *See*—
Bataev, Mikhail Kirillovich; Veits, Isaak Efimovich; Gorodetsky, Sergei Sergeevich; Macheret, Lev Ilich; Kuznetsov, Lev Alexeevich; Tjurin, Albert Vasilievich; and Yaunzem, Jury Eduardovich, 4,057,453, Cl. 156-390.000.

W. R. Grace & Co.: *See*—
Arguello, Leonard E., 4,057,740, Cl. 307-273.000.

WABCO Westinghouse GmbH: *See*—
Seegers, Guenter, 4,057,298, Cl. 303-84.00R.

Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See*—
Lechner, Gunther; Pritscher, Karl; and Kirschner, Helmut, 4,057,142, Cl. 206-332.000.
Schmidt, Dietrich; Huber, Karl Erwin; and Hofer, Johann, 4,057,395, Cl. 23-230.00R.

Wada, Tsuneo: *See*—
Habu, Teiji; Wada, Tsuneo; Sasaki, Takashi; Itoh, Shigemasa; Ohmura, Takayoshi; Ishii, Hiroki; and Yamaguchi, Hisashi, 4,057,538, Cl. 260-117.000.

Waese, Gerhard: *See*—
Bachmann, Wilfried; Gnabs, Christian; Janecka, Kurt; Mundlos, Eberhard; Papenfuhs, Theodor; and Waese, Gerhard, 4,057,576, Cl. 260-525.000.

Wager, Oleg, to Burcan International Limited. Earth drain. 4,057,500, Cl. 210-170.000.

Wagner, Klaus; Eue, Ludwig; Schmidt, Robert R.; and Roos, Ernst, to Bayer Aktiengesellschaft. 2,4-Bis-(trifluoromethyl)-6-nitrophenol compounds and herbicidal compositions. 4,057,419, Cl. 71-121.000.

Wagner, Wolfgang, to U.S. Philips Corporation. Device for measuring local radiation absorption in a body. 4,057,725, Cl. 250-360.000.

Waldmann, Hermann: *See*—
Fork, Kurt; Lambrecht, Dietrich; Waldmann, Hermann; and Hoffmann, Helmut, 4,057,714, Cl. 264-494.000.

Walker-Neer Manufacturing Co., Inc.: *See*—
Ford, George Alan, 4,057,118, Cl. 175-215.000.

Walker, Robert D., Jr., to United States of America, Energy Research and Development Administration. Molten salt battery having inorganic paper separator. 4,057,678, Cl. 429-104.000.

Wallace, Bernard E., to B. E. Wallace Products Corporation. Winch-hoist actuating apparatus. 4,057,218, Cl. 254-167.000.

Walt, Guido: *See*—
Lux, Benno; Kurz, Wilfried; Hubert, Jean-Claude; Mollard, Francois; and Walt, Guido, 4,057,097, Cl. 164-60.000.

Wang, Long Shyong: *See*—
Ruckel, Erwin Richard; and Wang, Long Shyong, 4,057,682, Cl. 526-190.000.

Ward, George C., to Southwire Company. Apparatus for conveying heated rod. 4,056,959, Cl. 72-128.000.

Ward, Robertson, Jr. Projection screen. 4,057,323, Cl. 350-125.000.

Warnke, Hans; and Boer, Werner, to Klockner-Werke AG. Valve plate arrangement for hydrostatic piston machines. 4,057,006, Cl. 91-487.000.

Warnod, Bertrand Antoine, to Klaxon S.A. Electro-acoustic signalling horns. 4,057,799, Cl. 340-388.000.

Waskonig, Walter: *See*—
Kalka, Josef; Waskonig, Walter; and Lueg, Karl, 4,056,981, Cl. 73-421.00B.

Wasyleczko, Zenon: *See*—
Chrobak, Eryk; Natkaniec, Benedykt; Wasyleczko, Zenon; Stawinski, Antoni; and Roczek, Andrzej, 4,056,929, Cl. 59-85.000.

Watanabe, Kenryo, to Sharp Kabushiki Kaisha. Channel type photoelectric energy transducer. 4,057,822, Cl. 357-52.000.

Watermann, Willy, to Klockner-Werke AG. Mine roof support for an underground mine gallery. 4,056,941, Cl. 61-45.00D.

Watts, Robert H.: *See*—
Bradbury, William B.; Watts, Robert H.; and Scott, E. Timm, 4,057,193, Cl. 241-281.000.

Wax, Archie E. Internal combustion engine system. 4,057,040, Cl. 123-46.00R.

Weaver, Benson C.: *See*—
Morrison, Charles F., Jr.; and Weaver, Benson C., 4,057,064, Cl. 128-303.170.

Weaver, Richard L. Silo unloader and apparatus therefor. 4,057,151, Cl. 214-17.0DA.

Weaver, Richard L. Silo center discharge apparatus. 4,057,152, Cl. 214-17.0DA.

Weaver, Richard L. Silo center discharge mechanism. 4,057,153, Cl. 214-17.0DA.

Webb, Robert Lee: *See*—
Mendelson, Wilford Lee; and Webb, Robert Lee, 4,057,585, Cl. 260-612.00D.

Weber, Alfred; Muller, Rudolf; and Kurzidim, Johannes, to Schering Aktiengesellschaft. Method for isolation of 3-hydroxy steroids and 3-keto steroids. 4,057,541, Cl. 260-239.55A.

Weber, Carl W. Inflatable cushion and method of making the same. 4,056,858, Cl. 5-365.000.

Wegemund, Bernd: *See*—
Hase, Brigitte; Hase, Christian; Galinke, Joachim; and Wegemund, Bernd, 4,057,622, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,057,623, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,057,624, Cl. 424-78.000.
Hase, Brigitte; Galinke, Joachim; and Wegemund, Bernd, 4,057,625, Cl. 424-78.000.

Weiss, Martin Joseph: *See*—
Grudzinskas, Charles Vincent; and Weiss, Martin Joseph, 4,057,571, Cl. 560-121.000.

Weissel, Oskar: *See*—
Krall, Hermann-Dieter; Weissel, Oskar; and Schwarz, Hans-Helmut, 4,057,581, Cl. 260-571.000.

Welge, Frederick T.: *See*—
Redmore, Derek; and Welge, Frederick T., 4,057,554, Cl. 260-296.00D.

Wellman, Lester R. Article holding double-sling kit. 4,057,210, Cl. 248-318.000.

Wenzel, Werner, to Nordischer Maschinenbau Rud. Baader. Fish processing machines. 4,056,866, Cl. 17-57.000.

Werbenec, Jean-Pierre: *See*—
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; Werbenec, Jean-Pierre; and Broll, Madeleine, 4,057,644, Cl. 424-325.000.

Wert, Edward; and Fisher, Chester Donald, to Koppers Company, Inc. Elevator belt splice. 4,056,867, Cl. 24-37.000.

Wesselhoft, Robert D.: *See*—
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Young, Clyde J. Electrical coupling apparatus. 4,057,310, Cl. 339-10.000.

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 475,801	4,056,759	Mar. 30, 1976	Nov. 1, 1977
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B4 82,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,439	4,057,521	Apr. 13, 1976	Nov. 8, 1977
B 494,440	4,056,502	Feb. 17, 1976	Nov. 1, 1977
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977	B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 537,990	4,057,651	Jan. 13, 1976	Nov. 8, 1977
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977	B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977	B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976	B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF NOVEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See*—
Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, Re. 29,469, Cl. 560-121.000.

Brandt-Pra, Inc.: *See*—
Jones, Alan P., Re. 29,470, Cl. 235-92.0SB.

Clayton, Anthony B., to Hercules Incorporated. Process for making a C_1-C_7 aliphatic hydrocarbyl ester of an N-[2,6-di(C_1-C_7 alkyl)phenyl] α-aminocarboxylic acid. Re. 29,468, Cl. 560-43.000.

Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Hydroxylated 15-deoxy derivatives of 9-hydroxyl-13-trans-prostenoic acid. Re. 29,469, Cl. 560-121.000.

Hercules Incorporated: *See*—
Clayton, Anthony B., Re. 29,468, Cl. 560-43.000.

Jones, Alan P., to Brandt-Pra, Inc. Control mechanisms for document-handling apparatus. Re. 29,470, Cl. 235-92.0SB.

Levy, Ezra: *See*—
Nussim, Manasse; Levy, Ezra; and Naiman, Jacob, Re. 29,467, Cl. 260-465.00D.

McGahren, William James: *See*—
Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, Re. 29,469, Cl. 560-121.000.

Naiman, Jacob: *See*—
Nussim, Manasse; Levy, Ezra; and Naiman, Jacob, Re. 29,467, Cl. 260-465.00D.

Nussim, Manasse; Levy, Ezra; and Naiman, Jacob, to Plantex, Ltd. Benzylcyano-amides. Re. 29,467, Cl. 260-465.00D.

Plantex, Ltd.: *See*—
Nussim, Manasse; Levy, Ezra; and Naiman, Jacob, Re. 29,467, Cl. 260-465.00D.

Schaub, Robert Eugene: *See*—
Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, Re. 29,469, Cl. 560-121.000.

Weiss, Martin Joseph: *See*—
Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, Re. 29,469, Cl. 560-121.000.

LIST OF PLANT PATENTEES

Brooklyn Botanic Garden Corporation: *See*—
Specht, Carl H., 4,145, Cl. 51.000.

Denver Wholesale Florists Company: *See*—
Krapes, David A., 4,143, Cl. 73.000.

Gordon, Robert B. Apple tree. 4,144, 11-8-77, Cl. 34.000.

Krapes, David A., to Denver Wholesale Florists Company. Carnation named Renegade. 4,143, 11-8-77, Cl. 73.000.

Schwantje, Werner, to Sunnyside Nurseries, Inc. African Violet plant — Paula. 4,147, 11-8-77, Cl. 69.000.

Simpson, Robert C. *Ilex verticillata* bush named Winter Red. 4,146, 11-8-77, Cl. 65.000.

Specht, Carl H., to Brooklyn Botanic Garden Corporation. Magnolia tree. 4,145, 11-8-77, Cl. 51.000.

Sunnyside Nurseries, Inc.: *See*—
Schwantje, Werner, 4,147, Cl. 69.000.

LIST OF DESIGN PATENTEES

Airwick Industries, Inc.: *See*—
Hadtke, Frederick B., 246,316, Cl. D23-150.000.
Heath, Eric Desmond; Young, Stewart Charles Arthur; Wade, Michael James; and Smith, Brian, 246,317, Cl. D23-150.000.
Layton, Albert F.; and Hadtke, Frederick B., 246,318, Cl. D23-150.000.
Rabussier, Bernard; Mandon, Jean-Pierre; Lecomte, Philippe; and Nuer, Louis, 246,319, Cl. D23-150.000.

Astra Lakemedel Aktiebolag: *See*—
Lofman, Claes Peter, 246,321, Cl. D24-24.000.

Ballas, George C., Sr.: *See*—
Dortch, Charles W.; and Vaught, Donald K., 246,300, Cl. D12-105.000.

Bay, William P. Sun visor. 246,272, 11-8-77, Cl. D2-233.000.

Bell & Howell Company: *See*—
Kubnick, Norman R.; and Erber, Dennis J., 246,314, Cl. D16-18.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Ink ribbon cartridge. 246,332, 11-8-77, Cl. D64-11.00A.

Boecher, Walter, Jr. Card holder or the like. 246,333, 11-8-77, Cl. D96-12.00A.

Boucher, Richard A., to Dart Industries Inc. Food container. 246,288, 11-8-77, Cl. D9-219.000.

Boucher, Richard A., to Dart Industries Inc. Food container. 246,289, 11-8-77, Cl. D9-240.000.

Buckeye Industrial Sales, Inc.: *See*—
Gunn, John C.; and Null, James E., 246,313, Cl. D15-148.000.

Cari-All Inc.: *See*—
Trubiano, Antoine, 246,301, Cl. D12-129.000.

Carlson, Arthur E.: *See*—
Whitley, Warwick M.; and Carlson, Arthur E., 246,297, Cl. D12-62.000.

CBS Inc.: *See*—
Fields, Grover G., 246,331, Cl. D56-1.00A.

Cerniway, Leon A.; and Marx, Bruce C., to U.S. Divers Co. Diving helmet. 246,271, 11-8-77, Cl. D2-232.000.

Conroy, Inc.: *See*—
Whitley, Warwick M.; and Carlson, Arthur E., 246,297, Cl. D12-62.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Tongs. 246,280, 11-8-77, Cl. D7-105.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Fujii, Mituru; and Narusawa, Izumi, 246,296, Cl. D12-53.000.

Dart Industries Inc.: *See*—
Boucher, Richard A., 246,288, Cl. D9-219.000.
Boucher, Richard A., 246,289, Cl. D9-240.000.
Daenen, Robert H. C. M., 246,280, Cl. D7-105.000.

Davis, Dan Lee. Protective partition for public transportation vehicles. 246,303, 11-8-77, Cl. D12-195.000.

Dortch, Charles W.; and Vaught, Donald K., to Ballas, George C., Sr. Trailer. 246,300, 11-8-77, Cl. D12-105.000.

Doughty, Michael V. Adjustable bracelet or similar article. 246,293, 11-8-77, Cl. D11-4.000.

Duchnowski, Frank A.: *See*—
Gordon, John Herbert; and Duchnowski, Frank A., 246,312, Cl. D15-135.000.

Erber, Dennis J.: *See*—
Kubnick, Norman R.; and Erber, Dennis J., 246,314, Cl. D16-18.000.

Ferrara-Benedek Design, Inc.: *See*—
Ferrara, Daniel A., Jr., 246,281, Cl. D7-150.000.

Ferrara, Daniel A., Jr., to Ferrara-Benedek Design, Inc. Knife. 246,281, 11-8-77, Cl. D7-150.000.

Fields, Grover G., to CBS Inc. Guitar head. 246,331, 11-8-77, Cl. D56-1.00A.

Forselius, Frank. Snack tray. 246,277, 11-8-77, Cl. D7-38.000.

Forselius, Frank. Snack tray. 246,278, 11-8-77, Cl. D7-38.000.

Fountain Industries, Inc.: *See—*
Syverson, Martelle Jerome, deceased; Syverson, David B.; and Syverson, Jon R., executors, 246,310, Cl. D15-113.000.
Syverson, Martelle Jerome, deceased; Syverson, David B.; and Syverson, Jon R., executors, 246,311, Cl. D15-116.000.

Fujii, Mituru; and Narusawa, Izumi, to Dainippon Ink and Chemicals, Inc. Pallet. 246,296, 11-8-77, Cl. D12-53.000.

Gallagher, Fred James. Hand driven caulking gun. 246,285, 11-8-77, Cl. D8-14.100.

Gergely, William, Jr.; and Kwan, Okun. Cassette recorder housing. 246,305, 11-8-77, Cl. D14-6.000.

Gordon, John Herbert; and Duchnowski, Frank A., to J. H. Horne & Sons Company, Inc. Apparatus for forming paper on a cylinder mold. 246,312, 11-8-77, Cl. D15-135.000.

Grossman, Bruce: *See—*
Nelson, Carl; and Grossman, Bruce, 246,274, Cl. D6-234.000.

Gunn, John C.; and Null, James E., to Buckeye Industrial Sales, Inc. Pulley, shaft and blade-holder assembly for a power-driven lawnmower or the like. 246,313, 11-8-77, Cl. D15-148.000.

H. F. Coors Company, Inc.: *See—*
Lund, Otto J., 246,276, Cl. D7-35.000.

Haas, Frederick Arnold, Jr. Napkin stand. 246,279, 11-8-77, Cl. D7-72.000.

Hadtke, Frederick B., to Airwick Industries, Inc. Dispenser for air treating material. 246,316, 11-8-77, Cl. D23-150.000.

Hadtke, Frederick B.: *See—*
Layton, Albert F.; and Hadtke, Frederick B., 246,318, Cl. D23-150.000.

Haggard, Robert E. Electric car. 246,299, 11-8-77, Cl. D12-90.000.

Hansen, Carl I. Amphibious airplane. 246,298, 11-8-77, Cl. D12-75.000.

Hawkins, Kenneth R.: *See—*
Krase, Kenneth P.; and Hawkins, Kenneth R., 246,330, Cl. D48-23.00A.

Heath, Eric Desmond; Young, Stewart Charles Arthur; Wade, Michael James; and Smith, Brian, to Airwick Industries, Inc. Dispenser for air-treating material. 246,317, 11-8-77, Cl. D23-150.000.

Hetherington, Susan Kaye. Artificial leaf. 246,294, 11-8-77, Cl. D11-117.000.

Holmes, Arthur: *See—*
Hopkins, John Leslie; and Holmes, Arthur, 246,335, Cl. D96-2.000.

Hopkins, John Leslie; and Holmes, Arthur. Milk requirement indicator. 246,335, 11-8-77, Cl. D96-2.000.

Horn, James. Vehicle interior partition. 246,304, 11-8-77, Cl. D12-195.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Bellini, Mario, 246,332, Cl. D64-11.00A.

J. H. Horne & Sons Company, Inc.: *See—*
Gordon, John Herbert; and Duchnowski, Frank A., 246,312, Cl. D15-135.000.

Jackson, Dennis B., to Wiltshire Cutlery Company Proprietary Ltd. Knife handle. 246,282, 11-8-77, Cl. D7-152.000.

Jordan, Kenneth Albert, to Trip-Lite Ltd. Yarn fault detector. 246,292, 11-8-77, Cl. D10-46.000.

Kavis, George. Combined storage cabinet projector support and movie screen unit. 246,273, 11-8-77, Cl. D6-161.000.

Kenall Manufacturing Company: *See—*
Krase, Kenneth P.; and Hawkins, Kenneth R., 246,330, Cl. D48-23.00A.

Kirk, John. Decorative end piece for use on upright ends of free-standing office dividers. 246,323, 11-8-77, Cl. D25-75.000.

Kishi, Yoshio, to Sony Corporation. Tape cassette. 246,306, 11-8-77, Cl. D14-11.000.

Kishi, Yoshio, to Sony Corporation. Tape cassette. 246,307, 11-8-77, Cl. D14-11.000.

Krase, Kenneth P.; and Hawkins, Kenneth R., to Kenall Manufacturing Company. Fluorescent light fixture. 246,330, 11-8-77, Cl. D48-23.00A.

Krolopp, Rudolph William, to Motorola, Inc. Wattmeter or similar housing. 246,291, 11-8-77, Cl. D10-75.000.

Krygier, James S. Maxillary orthopedic suture separating orthodontic appliance. 246,322, 11-8-77, Cl. D24-34.000.

Kubnick, Norman R.; and Erber, Dennis J., to Bell & Howell Company. Filmstrip projector. 246,314, 11-8-77, Cl. D16-18.000.

Kwan, Okun: *See—*
Gergely, William, Jr.; and Kwan, Okun, 246,305, Cl. D14-6.000.

Layton, Albert F.; and Hadtke, Frederick B., to Airwick Industries, Inc. Dispenser for air treating material. 246,318, 11-8-77, Cl. D23-150.000.

Lecomte, Philippe: *See—*
Rabussier, Bernard; Mandon, Jean-Pierre; Lecomte, Philippe; and Nuer, Louis, 246,319, Cl. D23-150.000.

Lewis, Richard C. Convertible plaque. 246,295, 11-8-77, Cl. D11-133.000.

Little, Harry H. Golf putter head. 246,329, 11-8-77, Cl. D34-5.0GH.

Lofman, Claes Peter, to Astra Lakemedel Aktiebolag. Disposable syringe for storing and administering pharmaceutical preparations. 246,321, 11-8-77, Cl. D24-24.000.

Lund, Otto J., to H. F. Coors Company, Inc. Dinner plate. 246,276, 11-8-77, Cl. D7-35.000.

Luther, Dan L. Game board. 246,327, 11-8-77, Cl. D34-5.0PB.

Mandon, Jean-Pierre: *See—*
Rabussier, Bernard; Mandon, Jean-Pierre; Lecomte, Philippe; and Nuer, Louis, 246,319, Cl. D23-150.000.

Marx, Bruce C.: *See—*
Cerniway, Leon A.; and Marx, Bruce C., 246,271, Cl. D2-232.000.

Mira-X S.A. Suhr: *See—*
Panton, Verner, 246,334, Cl. D92-1.00T.

Moore Company, Inc., The: *See—*
Moore, Junius Thomas, 246,286, Cl. D8-360.000.

Moore, Junius Thomas, to Moore Company, Inc., The. Pulley. 246,286, 11-8-77, Cl. D8-360.000.

Motorola, Inc.: *See—*
Krolopp, Rudolph William, 246,291, Cl. D10-75.000.

Nakamura, Aya, to Sharp Kabushiki Kaisha. Clock radio. 246,309, 11-8-77, Cl. D14-73.000.

Narusawa, Izumi: *See—*
Fujii, Mituru; and Narusawa, Izumi, 246,296, Cl. D12-53.000.

Nelson, Carl; and Grossman, Bruce. Combined storage and display device for graphic pictures or the like. 246,274, 11-8-77, Cl. D6-234.000.

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Rakocy, William J.; and Rauch, Howard L., 246,325, Cl. D29-2.000.

Nuer, Louis: *See—*
Rabussier, Bernard; Mandon, Jean-Pierre; Lecomte, Philippe; and Nuer, Louis, 246,319, Cl. D23-150.000.

Null, James E.: *See—*
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Pelton & Crane Company: *See—*
Truette, Danny Michael, 246,320, Cl. D24-5.000.

Rabussier, Bernard; Mandon, Jean-Pierre; Lecomte, Philippe; and Nuer, Louis, to Airwick Industries, Inc. Dispenser for air treating material. 246,319, 11-8-77, Cl. D23-150.000.

Rakocy, William J.; and Rauch, Howard L., to North American Philips Corporation. Fire extinguisher. 246,325, 11-8-77, Cl. D29-2.000.

Rauch, Howard L.: *See—*
Rakocy, William J.; and Rauch, Howard L., 246,325, Cl. D29-2.000.

Salas Arce, Edelmiro. Device for removing sheets from a file of papers. 246,284, 11-8-77, Cl. D8-14.000.

Sapowith, Alan D. Ski boot buckling tool. 246,283, 11-8-77, Cl. D8-14.000.

Scantlin, John R. Illuminated telephone dial. 246,308, 11-8-77, Cl. D14-66.000.

Sharp Kabushiki Kaisha: *See—*
Nakamura, Aya, 246,309, Cl. D14-73.000.

Shelton, Charles R. Clock. 246,290, 11-8-77, Cl. D10-6.000.

SiLITE, Incorporated: *See—*
Wiley, Robert L., 246,275, Cl. D7-21.000.

Smith, Brian: *See—*
Heath, Eric Desmond; Young, Stewart Charles Arthur; Wade, Michael James; and Smith, Brian, 246,317, Cl. D23-150.000.

Sony Corporation: *See—*
Kishi, Yoshio, 246,306, Cl. D14-11.000.
Kishi, Yoshio, 246,307, Cl. D14-11.000.

Syverson, David B.: *See—*
Syverson, Martelle Jerome, deceased; Syverson, David B.; and Syverson, Jon R., executors, 246,310, Cl. D15-113.000.
Syverson, Martelle Jerome, deceased; Syverson, David B.; and Syverson, Jon R., executors, 246,311, Cl. D15-116.000.

Syverson, Jon R., executors: *See—*
Syverson, Martelle Jerome, deceased; Syverson, David B.; and Syverson, Jon R., executors, 246,310, Cl. D15-113.000.
Syverson, Martelle Jerome, deceased; Syverson, David B.; and Syverson, Jon R., executors, 246,311, Cl. D15-116.000.

Syverson, Martelle Jerome, deceased; by Syverson, David B.; and Syverson, Jon R., executors, to Fountain Industries, Inc. Coffee dispenser. 246,310, 11-8-77, Cl. D15-113.000.

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Jordan, Kenneth Albert, 246,292, Cl. D10-46.000.

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Cerniway, Leon A.; and Marx, Bruce C., 246,271, Cl. D2-232.000.

U.S. Philips Corporation: *See—*
Oord, Klaas Tiemen, 246,324, Cl. D28-50.000.

Vaught, Donald K.: *See—*
Dortch, Charles W.; and Vaught, Donald K., 246,300, Cl. D12-105.000.

Wade, Michael James: *See—*
Heath, Eric Desmond; Young, Stewart Charles Arthur; Wade, Michael James; and Smith, Brian, 246,317, Cl. D23-150.000.

Watson, James R. Backgammon gameboard. 246,326, 11-8-77, Cl. D34-5.0SS.

Whitley, Warwick M.; and Carlson, Arthur E., to Conroy, Inc. Boats. 246,297, 11-8-77, Cl. D12-62.000.

Wiley, Robert L., to SiLITE, Incorporated. Compartmented plate. 246,275, 11-8-77, Cl. D7-21.000.

Wiltshire Cutlery Company Proprietary Ltd.: *See—*
Jackson, Dennis B., 246,282, Cl. D7-152.000.

Young, Stewart Charles Arthur: *See—*
Heath, Eric Desmond; Young, Stewart Charles Arthur; Wade, Michael James; and Smith, Brian, 246,317, Cl. D23-150.000.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 8, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

417 4,056,852
443 4,056,853

CLASS 3

1.5 4,056,854
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CLASS 4

67 A 4,056,856

CLASS 5

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365 4,056,858

CLASS 7

14.1 R 4,056,859

CLASS 8

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2.5 A 4,057,388
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155.1 4,056,860

CLASS 9

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CLASS 21

2.7 R 4,057,390
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230 R 4,057,395
252 R 4,057,396
259.1 4,057,392
288 B 4,057,397

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205.16 C 4,056,868
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132 4,056,873
234 4,056,875
469 4,056,877
469.5 4,056,876
526 R 4,056,878
572 4,056,879
592 R 4,056,881
596 4,056,880
597 4,056,882
611 4,056,883
623 4,056,884
623.1 4,056,885

CLASS 33

10 4,056,886
126.6 4,056,887
174 C 4,056,888
188 4,056,889

CLASS 34

55 4,056,891

CLASS 35

10 4,056,892

CLASS 37

142 R 4,056,893

CLASS 40

104.03 4,056,894

CLASS 43

3 4,056,890

CLASS 44

4 4,057,398
6 4,057,399

CLASS 46

1 R 4,056,895
132 4,056,896

CLASS 47

39 4,056,897
48.5 4,056,898
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CLASS 48

77 4,057,400
111 4,057,401
197 R 4,057,402

CLASS 51

33 W 4,056,900
165.87 4,056,901

CLASS 52

73 4,056,902
122 4,056,903
127 4,056,904
223 R 4,056,905
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CLASS 53

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59 R 4,056,915
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142 4,056,920
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105 4,057,405
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34 AT 4,056,925
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CLASS 58

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CLASS 59

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CLASS 60

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311 4,056,934
632 4,056,935

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96 4,056,943
107 4,056,944
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121 4,056,946
148 4,056,947
155 4,056,948
373 4,056,949
381 4,056,950

CLASS 63

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65 A 4,057,410
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229 4,057,412

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446 4,056,956

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90 4,057,415
4,057,416
93 4,057,417
103 4,057,418
121 4,057,419

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148 4,056,961
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253 R 4,056,963
273 4,056,964
351 4,056,965

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1 G 4,056,966
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19 4,056,968
28 4,056,969
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92 4,056,974
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272 R 4,056,977
304 R 4,056,978
313 4,056,979
398 AR 4,056,980
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423 R 4,056,983
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629 4,056,970
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689 4,056,987
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781 R 4,056,990
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.5 R 4,056,874
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86 4,057,422
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479 4,056,999

CLASS 85

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CLASS 86

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CLASS 89

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CLASS 91

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413 4,057,005
487 4,057,006
501 4,057,007

CLASS 93

53 BF 4,057,008

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3 4,057,425
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56.2 4,057,432
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100 R 4,057,430
115 R 4,057,431

CLASS 100

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50 4,057,010

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93.29 4,057,015
153 4,057,012
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CLASS 104

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CLASS 106

38.3 4,057,433
39.7 4,057,434
47 Q 4,057,435
288 Q 4,057,436

CLASS 110

28 A 4,057,021

CLASS 113

120 G 4,057,022

CLASS 114

107 4,057,023
210 4,057,025
221 A 4,057,026
298 4,057,024

CLASS 115

39 4,057,027
42 4,057,028

CLASS 116

114 V 4,057,029
175 4,057,030

CLASS 119

1 4,057,031
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CLASS 122

32 4,057,033
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43 B 4,057,039
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2 V 4,057,049
2 Z 4,057,051
24 R 4,057,046
25 B 4,057,053
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81 A 4,057,055
83.5 4,057,056
142.4 4,057,057
142.7 4,057,058
145.8 4,057,059
232 4,057,060
284 4,057,061
295 4,057,062
303.17 4,057,063
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348 4,057,065
349 R 4,057,066
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419 P 4,057,068
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CLASS 134

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413 4,057,076
625.2 4,057,078
625.23 4,057,079
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CLASS 139

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CLASS 148

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353 R 4,057,091
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320 4,057,451
384 4,057,452
390 4,057,453
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410 4,057,455
515 4,057,456
571 4,057,457
603 4,057,458
630 4,057,459
643 4,057,460

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CLASS 160

37 4,057,094
392 4,057,095

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19 4,057,461

CLASS 164

49 4,057,096
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260 4,057,099
418 4,057,100

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8 4,057,102
11 4,057,103
35 4,057,104
119 4,057,105

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65 4,057,467
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16 D 4,057,520
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84 C 4,057,700
153 H 4,057,716
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6 DK 4,057,150
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83.28 4,057,155
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CLASS 269

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CLASS 271

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134 CH 4,057,254
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CLASS 279

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CLASS 280

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106 R 4,057,263
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CLASS 285

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CLASS 290

54 4,057,270

CLASS 292

87 4,057,271
128 4,057,272
218 4,057,273
259 R 4,057,274
340 4,057,275

CLASS 294

19 R 4,057,276
50.8 4,057,277
88 4,057,278
93 4,057,279

CLASS 296

1 S 4,057,280
3 4,057,281
10 4,057,282
23 C 4,057,283
23 F 4,057,284
23 H 4,057,285
43 4,057,286
97 K 4,057,287

CLASS 297

239 4,057,288
259 4,057,289
389 4,057,290
441 4,057,291
452 4,057,292

CLASS 299

2 4,057,293
93 4,057,294

CLASS 302

56 4,057,295

CLASS 303

6 C 4,057,296
71 4,057,297
84 R 4,057,298
92 4,057,299
113 4,057,300
114 4,057,301

CLASS 305

19 4,057,302

CLASS 307

10 LS 4,057,742
11 4,057,735
78 4,057,736
147 4,057,737
247 A 4,057,738
270 4,057,739
273 4,057,740
279 4,057,741
296 R 4,057,743

CLASS 308

3.6 4,057,303
237 A 4,057,304

CLASS 310

27 4,057,744

CLASS 312

11 4,057,305
218 4,057,306
219 4,057,307
262 4,057,308
290 4,057,309

CLASS 313

55 4,057,745
237 4,057,746
413 4,057,747

CLASS 315

3.5 4,057,748
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316 4,057,751

CLASS 318

345 B 4,057,752
376 4,057,753

CLASS 324

62 4,057,755
77 B 4,057,756
207 4,057,754

CLASS 325

16 4,057,757
56 4,057,758
320 4,057,759
455 4,057,760

CLASS 328

154 4,057,761

CLASS 329

50 4,057,762

CLASS 330

107 4,057,766
207 P 4,057,767
264 4,057,764
279 4,057,765
288 4,057,763

CLASS 331

1 A 4,057,768
49 4,057,769
94.5 Q 4,057,770

CLASS 333

70 R 4,057,771
83 T 4,057,772

CLASS 335

205 4,057,773

CLASS 337

164 4,057,774
186 4,057,775
295 4,057,776

CLASS 338

309 4,057,777

CLASS 339

10 4,057,310
17 M 4,057,311
21 R 4,057,312
33 4,057,313
97 R 4,057,314
221 R 4,057,315

CLASS 340

2 4,057,778
3 C 4,057,779
15.5 MC 4,057,780
18 LD 4,057,781
27 AT 4,057,782
58 4,057,783
146.3 F 4,057,784
163 4,057,785
224 4,057,790
261 4,057,791
267 C 4,057,792
310 R 4,057,793
311 4,057,794
347 AD 4,057,795
4,057,796
347 DD 4,057,797
388 4,057,799
420 4,057,798

CLASS 343

8 4,057,800
12 R 4,057,801
100 LE 4,057,802
113 R 4,057,803
200 4,057,804
225 4,057,805

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33 R 4,057,806
107 R 4,057,808
140 R 4,057,807

CLASS 350

1 4,057,316
3.5 4,057,317
19 4,057,318
96 C 4,057,319
96 GN 4,057,320
96 R 4,057,322
96 WG 4,057,321
125 4,057,323
150 4,057,324
160 LC 4,057,325
162 R 4,057,326
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214 4,057,328
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223 4,057,330
285 4,057,331
319 4,057,332

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175 4,057,334
188 4,057,335

CLASS 353

6 4,057,336
26 R 4,057,337

CLASS 354

23 D 4,057,809
29 4,057,810
33 4,057,811
51 4,057,812
144 4,057,813
204 4,057,814
288 4,057,815
293 4,057,816
298 4,057,817
4,057,818

CLASS 355

1 4,057,338
3 R 4,057,339
4 4,057,340
8 4,057,341
4,057,342
16 4,057,343
4,057,344
35 4,057,345
41 4,057,346
67 4,057,347
75 4,057,348

CLASS 356

45 4,057,349
178 4,057,352
199 4,057,350
238 4,057,351

CLASS 357

23 4,057,819
4,057,820
4,057,821
52 4,057,822
4,057,823
56 4,057,824
81 4,057,825

CLASS 358

4 4,057,826
8 4,057,827
32 4,057,828

86	4,057,829
127	4,057,830
128	4,057,831
	4,057,832
	4,057,833
133	4,057,834
140	4,057,835
	4,057,836
254	4,057,837
299	4,057,838
CLASS 360	
93	4,057,839
99	4,057,840
CLASS 361	
64	4,057,841
93	4,057,842
104	4,057,843
111	4,057,844
CLASS 362	
249	4,057,718
CLASS 364	
200	4,057,845
	4,057,846
	4,057,847
	4,057,848
	4,057,849
	4,057,850
426.2	4,057,712
476	4,057,713
494	4,057,715
600	4,057,711
802	4,057,717
CLASS 365	
76	4,057,786
104	4,057,787
174	4,057,788
189	4,057,789
CLASS 366	
2	4,057,227
79	4,057,228
123	4,057,222
157	4,057,225
172	4,057,223
244	4,057,226
336	4,057,224
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43	4,057,353
199	4,057,354
CLASS 403	
2	4,057,355
219	4,057,356
CLASS 407	
114	4,056,871
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CLASS 408	
67	4,057,357
91	4,057,358
CLASS 415	
9	4,057,359
25	4,057,360
53 R	4,057,361
170 R	4,057,362
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145	4,057,363
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34	4,057,364
44	4,057,365
234	4,057,366
273	4,057,367
313	4,057,368
365	4,057,369
366	4,057,370
409	4,057,371
424	4,057,372
519	4,057,373
CLASS 418	
36	4,057,374
189	4,057,375
CLASS 423	
127	4,057,611
443	4,057,613
490	4,057,614
CLASS 424	
1	4,057,615
	4,057,616
	4,057,617
	4,057,618
14	4,057,619
35	4,057,620
49	4,057,621
78	4,057,622
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101	4,057,628
177	4,057,629
204	4,057,630
246	4,057,631
248.54	4,057,632
250	4,057,633
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261	4,057,635
263	4,057,636
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270	4,057,638
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274	4,057,640
283	4,057,641
304	4,057,642
305	4,057,556
311	4,057,643
325	4,057,644
329	4,057,645
331	4,057,646
340	4,057,647
341	4,057,648
CLASS 425	
73	4,057,376
135	4,057,377
137	4,057,378
199	4,057,379
324.1	4,057,380
345	4,057,381
387.1	4,057,382
405 H	4,057,383
459	4,057,384
466	4,057,385
526	4,057,386
CLASS 426	
15	4,057,649
92	4,057,650
388	4,057,652
513	4,057,653
555	4,057,654
583	4,057,655
630	4,057,656
CLASS 427	
44	4,057,657
	4,057,658
89	4,057,659
100	4,057,660
125	4,057,661
209	4,057,662
307	4,057,663
386	4,057,664
CLASS 428	
8	4,057,665
35	4,057,666
	4,057,667
85	4,057,668
152	4,057,669
189	4,057,670
208	4,057,671
220	4,057,672
411	4,057,673
481	4,057,674
CLASS 429	
39	4,057,675
50	4,057,676
100	4,057,677
104	4,057,678
194	4,057,679
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142	4,057,680
185	4,057,681
190	4,057,682
194	4,057,683
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18	4,057,685
26	4,057,686
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428	4,057,545
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182	4,057,546
184	4,057,547
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305	4,057,558
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43	Re.29,468
52	4,057,573
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121	Re.29,469
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245	4,057,575

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D2—	232	246,271
	233	246,272
D6—	161	246,273
	234	246,274
D7—	21	246,275
	35	246,276
	38	246,277
		246,278
	72	246,279
	105	246,280
	150	246,281
	152	246,282
D8—	14	246,283
		246,284
	14.1	246,285
	360	246,286
D9—	177	246,287
	219	246,288
	240	246,289
D10—	6	246,290
	46	246,292
	75	246,291
D11—	4	246,293
	117	246,294
	133	246,295
D12—	53	246,296
	62	246,297
	75	246,298
	90	246,299
	105	246,300
	129	246,301
	130	246,302
	195	246,303
		246,304
D14—	6	246,305
	11	246,306
		246,307
	66	246,308
	73	246,309
D15—	113	246,310
	116	246,311
	135	246,312
	148	246,313
D16—	18	246,314
D23—	58	246,315
	150	246,316
		246,317
		246,318
		246,319
D24—	5	246,320
	24	246,321
	34	246,322
D25—	75	246,323
D28—	50	246,324
D29—	2	246,325
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1 : 4,057,178	4,057,510	4,057,793	4,057,542	4,056,976	4,057,574
4,057,196	4,057,520	4,057,803	4,057,543	4,057,007	4,057,595
2 : 4,057,367	4,057,563	13 : 4,056,959	4,057,575	4,057,015	4,057,633
4 : 4,057,031	4,057,567	4,057,096	4,057,580	4,057,023	4,057,645
4,057,165	4,057,577	4,057,145	4,057,582	4,057,086	4,057,667
4,057,282	4,057,589	4,057,448	4,057,685	4,057,115	4,057,709
4,057,283	4,057,628	4,057,621	4,057,705	4,057,212	27 : 4,057,068
4,057,618	4,057,651	16 : 4,057,088	4,057,726	4,057,425	4,057,072
4,057,708	4,057,675	4,057,180	4,057,727	4,057,483	4,057,123
5 : 4,057,639	4,057,719	17 : 4,056,884	4,057,731	4,057,679	4,057,156
6 : 4,056,856	4,057,730	4,056,890	4,057,775	4,057,699	4,057,250
4,056,865	4,057,736	4,056,893	4,057,813	4,057,759	4,057,257
4,056,870	4,057,740	4,056,895	4,057,828	4,057,786	4,057,261
4,056,877	4,057,745	4,056,898	18 : 4,056,888	4,057,788	4,057,449
4,056,891	4,057,766	4,056,955	4,057,014	4,057,811	4,057,787
4,056,892	4,057,772	4,056,989	4,057,020	4,057,815	4,057,818
4,056,899	4,057,821	4,057,019	4,057,024	4,057,816	4,057,847
4,056,962	4,057,836	4,057,028	4,057,125	4,057,839	28 : 4,057,108
4,056,975	4,057,844	4,057,036	4,057,131	4,057,849	29 : 4,057,189
4,056,999	8 : 4,056,983	4,057,047	4,057,274	26 : 4,056,861	4,057,201
4,057,029	4,057,064	4,057,054	4,057,394	4,056,862	4,057,262
4,057,032	4,057,222	4,057,065	4,057,826	4,056,864	4,057,292
4,057,085	4,057,284	4,057,087	19 : 4,057,005	4,056,869	4,057,309
4,057,119	4,057,611	4,057,094	4,057,044	4,056,872	4,057,390
4,057,144	4,057,760	4,057,105	4,057,109	4,056,901	4,057,548
4,057,160	4,057,808	4,057,112	4,057,207	4,056,938	4,057,554
4,057,168	9 : 4,056,948	4,057,121	4,057,701	4,056,940	4,057,616
4,057,169	4,056,971	4,057,122	20 : 4,057,619	4,056,961	30 : 4,057,254
4,057,170	4,057,011	4,057,130	21 : 4,057,008	4,056,977	31 : 4,057,358
4,057,174	4,057,053	4,057,133	4,057,051	4,056,979	32 : 4,056,912
4,057,182	4,057,164	4,057,148	22 : 4,056,913	4,056,993	4,056,998
4,057,183	4,057,227	4,057,149	4,057,275	4,057,027	33 : 4,057,802
4,057,194	4,057,363	4,057,208	4,057,487	4,057,114	34 : 4,056,874
4,057,235	4,057,523	4,057,210	4,057,594	4,057,120	4,056,885
4,057,245	4,057,590	4,057,214	24 : 4,056,854	4,057,129	4,056,894
4,057,246	4,057,650	4,057,223	4,056,879	4,057,134	4,056,908
4,057,252	4,057,654	4,057,230	4,056,997	4,057,137	4,056,973
4,057,267	4,057,682	4,057,241	4,057,000	4,057,190	4,057,052
4,057,280	4,057,756	4,057,247	4,057,002	4,057,192	4,057,060
4,057,293	10 : Re.29,468	4,057,248	4,057,104	4,057,209	4,057,078
4,057,351	4,057,441	4,057,251	4,057,140	4,057,236	4,057,143
4,057,352	4,057,565	4,057,259	4,057,167	4,057,265	4,057,176
4,057,359	4,057,638	4,057,281	4,057,238	4,057,301	4,057,177
4,057,372	4,057,805	4,057,297	4,057,288	4,057,304	4,057,187
4,057,375	12 : 4,056,886	4,057,305	4,057,439	4,057,307	4,057,193
4,057,396	4,056,887	4,057,314	4,057,470	4,057,317	4,057,217
4,057,422	4,056,951	4,057,323	4,057,524	4,057,355	4,057,249
4,057,450	4,056,953	4,057,329	4,057,569	4,057,517	4,057,313
4,057,460	4,057,001	4,057,332	4,057,735	4,057,528	4,057,320
4,057,466	4,057,285	4,057,357	4,057,820	4,057,531	4,057,338
4,057,476	4,057,360	4,057,366	25 : 4,056,852	4,057,564	4,057,349
4,057,484	4,057,678	4,057,402	4,056,875	4,057,566	4,057,350
4,057,485	4,057,742	4,057,502	4,056,967	4,057,572	4,057,354

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4,057,780
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4,057,025
4,057,039
4,057,126
4,057,138
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4,057,240
4,057,269
4,057,306
4,057,653
4,057,851

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9 : 246,281
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10 : 246,322
12 : 246,272
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25 : 246,279
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34 : 246,316
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36 : 246,302
37 : 246,320
39 : 246,313
40 : 246,294
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8 : 4,143
18 : 4,146
36 : 4,145

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